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Vol. XXXV November, 1941 Number 11

Here's why the 85-B fits defense requirements

Whether it's quarrying rock, loading coal or mining iron like this 85-B, a shovel today is subjected to the terrific 3-shift pounding of emergency defense demands. The Bucyrus-Erie 85-B meets the challenge easily because:

1—It delivers sustained high output: (a) speeds, torque and weight placement are scientifically balanced for fast digging; (b) maximum hoist motor power is actually applied at the dipper teeth; (c) perfect control permits easy maintenance of a fast operating cycle.

2—It keeps operating costs low because design and balance give smooth operation, reducing stresses and keeping maintenance requirements at a minimum. Elimination of excess weight means low power consumption per yard of output.

3—It is extremely versatile for a 117-ton machine. Can travel anywhere in the pit on its own tracks, quickly; can handle stripping or loading. Easily converted in the field to a dragline or crane.

Overall efficiency to take emergency work in stride, makes the 85-B an outstanding machine for defense and for you. Bucyrus-Erie Company, South Milwaukee, Wisconsin. See your dealer now.

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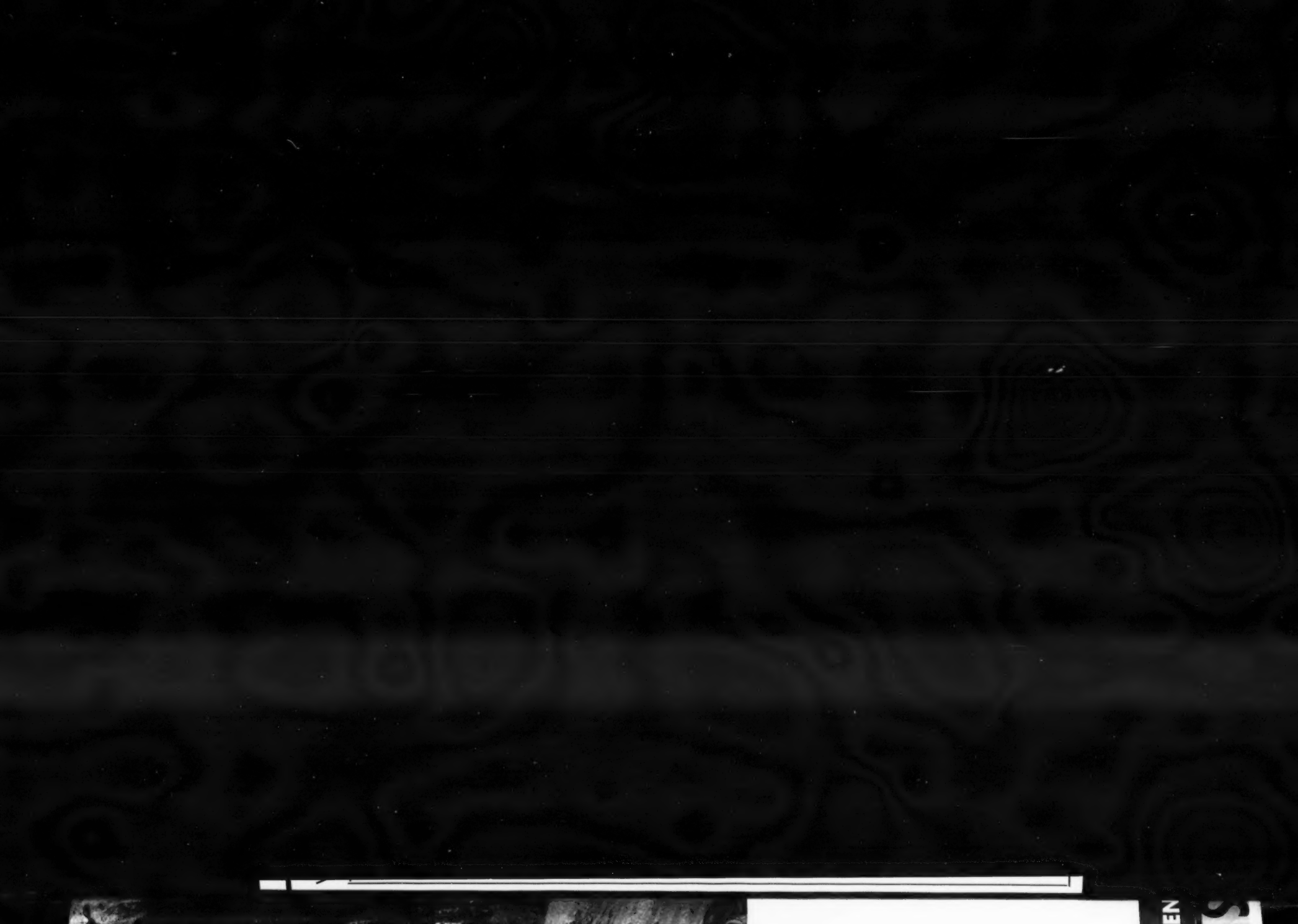
THE GROUNDWORK OF DEFENS



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View shows an International TD-18 TracTracTor, equipped with cable-operated bullgrader, carving a rig site north of Ventura, Calif. This outfit is owned by Chanslor Canfield Midway Oil Co., Los Angeles.

INTERNATIONAL Industrial Power

EXCAVATING
ENGINEER
NOVEMBER • 1941

Southwestern Portland Cement Company of Los Angeles meets the challenge of growing production problems by employing modern equipment in its Victorville cement operations

IN THE BEGINNING of time Victorville, California, lay on the bottom of the ocean. No traffic policemen patrolled the streets. There were no stores, nor shops, nor saloons where the weary traveller might hoist a tall, cool one. There was nothing but a mass of slimy green growth of aquatic life lying inert in the turquoise water.

Millions of tons of giant shellfish; clams, scallops and mollusks lay there over a bed of gravel. As they died their shells piled up generation after generation. By a process of decay the shells reverted back to lime.

But Victorville was not destined always to remain at the bottom of the sea. Some great unseen force from underneath gradually began to work the Victorville bed of shells up to the surface. The lime hardened to stone. The earth worked higher and higher, breaking up somewhat but by some prank of Nature it retained its general mass. A million years later, more or less, two men stood on a mountainside 2,000 feet above sea level east of El Cajon Pass. They stood on the ancient bed of shells, now turned to hard, heavy stone.

"Bill," said one of the assayers, "here is a natural site for a cement quarry. Our test pits show lime, iron ore and clay. That's mighty nearly all you need to make cement. The only railroad runs through the pass seven miles away. It's a natural, I tell you!"

"Yes," agreed the other, "one of these days someone will undoubtedly start quarrying this material. But first they'll have to prove its value as a construction material. The railroads are still using cut stone for their bridges, you know."

Producing "Victor" Cement

What happened afterward is construction history. Cement came into prominence as a construction agent, replacing brick and cut stone. Today it is indispensable. Twenty six years ago the Victorville deposit was tapped by the Southwestern Portland Cement Company of Los Angeles. Down through the years this company has developed the Victorville property until several quarries now are open and "Victor" brand cement is widely known wherever building and construction is undertaken on the Pacific Coast.

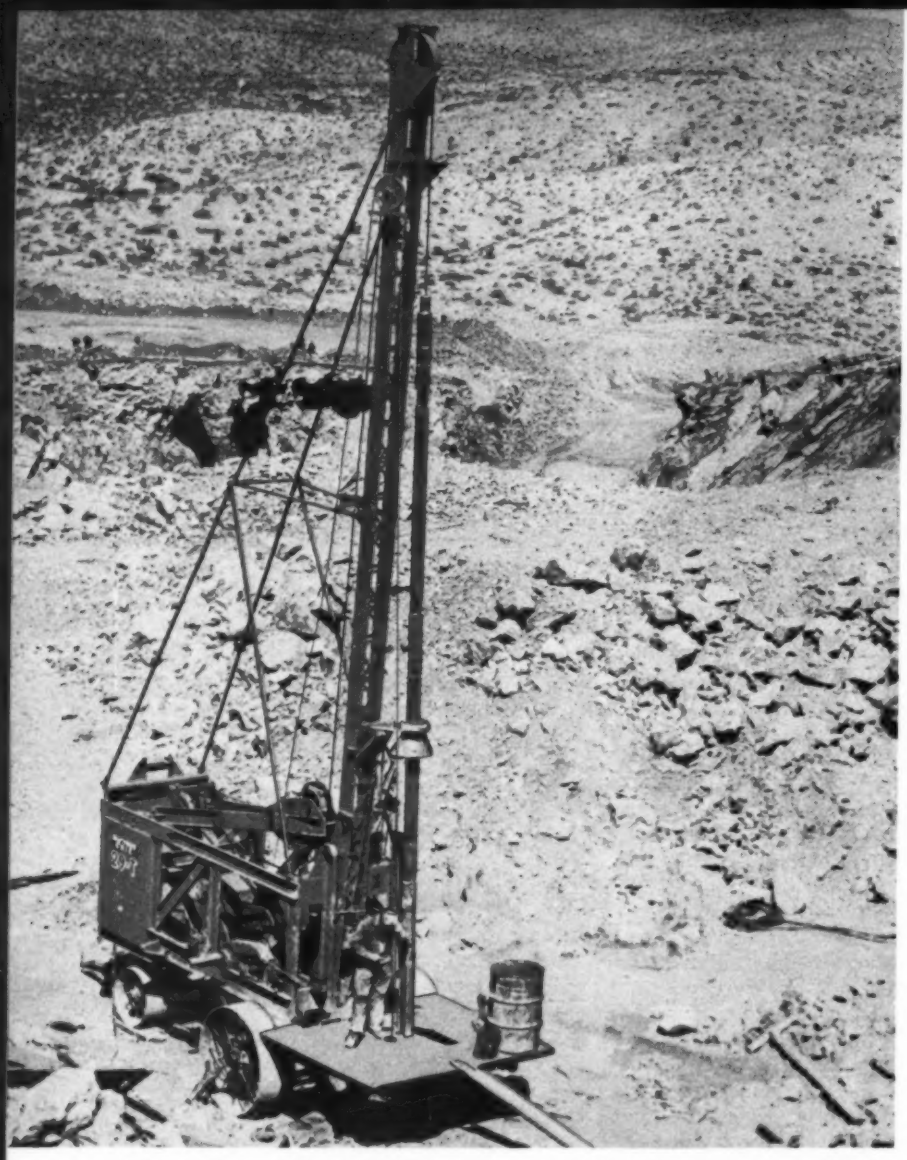
The Victorville deposit lies in high mountainous country about seven miles from the city. It is a sight to dismay the best drill man ever born. For the deposit lies in a great, jagged mass, shot through with cracks and fissures. Even before the first quarrymen put off the initial blast, they knew that here was a problem plenty tough for the best of them. Other drillers, operating the machines which punched holes down through the lime rock, have been dismayed since. A few drillers, coming out here from eastern quarries where limestone lies in sedimentary formations in thick, even layers have found their experience ill-adapted to this work at Victorville.

In the early days the best available power drills were used, but the present line-up of modern machinery shows up better by comparison. There was a tendency on the older machines for drill stems and bits to stick when they broke into seams and layers of soft material. Despite the fact that these drills plugged along fairly well in the more solid material, an important factor in getting along at all was the human skill of the drillers themselves, drillers who knew how treacherous seamy rock could be. To introduce a time worn saying, it was the old story of "rock lies flat and solid in the Mississippi basin but there isn't a whole piece left west of the Continental Divide."

The Southwestern Portland Cement Company was quick to realize that fact. Its management adequately kept pace with merchandising demands by using the newest Bucyrus-Erie drills of the period. Throughout the years the credo of that management has been simple and direct. "Modernize everywhere and watch production figures go up proportionately" guided the purchase of each new machine. Whenever a machinery company found a way to better its product, the purchase of that machine was considered if it answered a pressing need.

In that early day when blast

• Eight yards of Victorville limestone loaded by the Marion 2½-yard electric shovel shown on the opposite page are hauled and dumped into a waiting train by one of the company's Mack trucks. Note floodlights on the telephone poles for night operations.



• This Bucyrus-Erie 29-T blast hole drill is an important part of Southwestern's modernized operations. Swinging 2,626 pounds of tools it puts down about 7 feet of 9-inch hole per hour in the seamy material.

hole drills and churn drills came into general use the rule in shooting was "load 'em heavy, and don't touch off less than 20 tons of dynamite." One or two of these gigantic blasts were pulled before the management demurred.

The order soon went out to make smaller but more complete shots, for the big blasts, although they rolled down a greater amount of rock, did not result in thorough breakage. Now, not more than 300 cases of powder are shot at once. The company feels that if justice is to be done to a loading machine the rock must first be thoroughly broken.

Some years ago, along with the gasoline driven drills, the company brought in two Bucyrus-Erie railroad type shovels. Railroad tracks were laid into the main quarry. Later these machines were supplemented by a Marion 125 shovel and a 3½ cubic yard Marion 490 machine. Loading direct into the railroad cars, this system accounted for all the tonnage necessary in the early days. But even though it was adequate, still the company sought a better way.

After some study the management figured out a few years ago that it would be cheaper to build a main loading platform where a string of cars might be spotted for loading by a fleet of trucks. Soon six new Mack 8 cubic yard dump trucks, powered by Cummins diesel motors, were brought in. They saved the track laying expense in the quarry. They saved the cost of one locomotive formerly used for switching, and they speeded up the work.

With production increased, the company was faced with a disagreeable fact which it could not economically sidestep. It seemed that in making a main shot from a nearly vertical face that the toe would shatter above the floor level. This left a certain "high bottom" area where secondary shooting had to be done.

This secondary shooting was not desirable, to say the least. It tied up shovels, trucks, the locomotive and in fact the whole production schedule. Some means had to be devised to eliminate that evil. Again modern engineering and modern chemistry came to the rescue of these men of the Southwestern Company who were gifted with insight which made them see new possibilities in new developments.

These men watched DuPont, Hercules, Trojan and some of the rest of the powder companies introduce faster and faster explosives. As they improved, these men kept in step with those improvements. By and by the bottom of the holes were sprung enough to take a charge of powder sufficient to break the toe at floor level BEFORE it had time to spend itself in fracturing the wall above. In this manner the company ridded itself of all secondary shooting except for occasional large rocks which toppled down from near the top of the wall.

Improving the Loading Equipment

With that one out of the way it looked as if life would once more revert to normal around the cement plant. It didn't. More modern trends at the mill were imposing a heavier load on the quarry. The boom of one of the Marion shovels began to wear. Quarry Superintendent Frank Arnold and Chief Electrician Harry Black patched it up by interchanging the ailing part with a Bucyrus-Erie built boom, and then in facetious fun they asked all visiting salesmen, "Which is it, now: Marion or Bucyrus-Erie?"

When it began to appear as if

the program of national defense for the west coast might demand a greater supply of cement from the Victorville mill the company ordered a new Marion Type 4101 electric 2½ cubic yard quarry shovel to load the Mack trucks. Sporting a new coat of gray paint and Ward-Leonard electric controls, this new machine at last made the quarry look like the final answer to the dream of an entirely modern setup. All except for one important thing: an improved drill.

While the need for the new shovel was freely conceded, there were men in the company who contended that in order for the shovel to operate at its best, the lime rock had to be shot and shot properly. To be broken up adequately a certain amount of explosives had to work on a certain volume of rock, depending of course on the location in the big reservation.

To handle the company requirements, a blast hole drill was especially suitable. Was there a rugged blast hole drill somewhere, capable of striking a snappy, shattering blow? Could it easily handle a 9-inch drill bit over a longer stroke, thus increasing the penetration of the heavier tool string? Could such a machine, by increasing the hole size, reduce the number of moves and setups, and at the same time make possible equal breakage at reduced cost? There was. Such a revolutionary drill had recently been placed on the market by one of those steady manufacturers who are always improving their product.

So the company purchased and delivered to the quarry a new Bucyrus-Erie 29-T blast hole drill. Owing to rough terrain where drilling was proposed, the machine was mounted on wheels rather than on the usual crawler type mount characteristic of this drill. Its arrival brought the job's equipment line up up to date, enabling the plant to follow the present modern operations.

Very little stripping in the true sense of the word is necessary. Occasionally access cuts are dug to enable machines to get down to a lower level, and this is handled by a shovel and several trucks, supplemented by an Allis-Chalmers Model K mounted Crook bulldozer in the very few places where spalls or topping are encountered.

Blast Hole Drill Performance

The first major operation is always drilling, and the attention of everyone these days is focused on the new 29-T drill. This machine is driven by a General Electric motor operating from a 440 volt line in the quarry. Every machine on the job, as a matter of fact, is operated by electricity. The current is carried to the job over high voltage transmission lines.

Thus far the 29-T drill has demonstrated a new cycle in drilling work. It is always ready to go as soon as it can be spotted over a hole location determined by surveyors. Spotting is done by the Allis-Chalmers tractor.

Carrying 2,626 pounds of tools, the 29-T is pushing down 9-inch diameter holes through treacherous seamy material at the rate of about seven feet per hour. It is an actual fact that within two weeks after the drill was delivered, Driller L. O. Daniel bored out 44,256 cubic inches of hole in one 8 hour shift. That represents 58 feet of 9-inch hole drilled that shift. Compare these figures with 1¼-inch air driven drills, or even with smaller sized blast hole drills. It all adds up to the fact that the 29-T drilled in the record shift the equivalent of 3,025 linear feet of 1¼-inch hole! Fifty eight feet of hole doesn't seem like so very much, but when one thinks of it in terms of cubic inches it is apparent that considerable work has been accomplished.

The fact that it is so remarkable that a machine could bring about such increased production certainly bears out the company managerial theory that unless one keeps abreast of the times he's sure to lose out on the profits.

Two hundred and fifty feet of ¾-inch Roebling steel rope is carried on the bull reel to handle the heavy tools. The terrific walloping blow the drill delivers is cushioned with little jar or vibration on a special rubber shock absorber furnished as standard equipment at the top of the derrick immediately below the crown sheave. This shock absorber, made up of many round disc sections of rubber built up one on top of the other in the form of a cylinder, serves to snap the tool string back the instant the kinetic force of the drill blow has been spent. This shock absorber also protects the machine and its derrick from damage resulting from 56 blows per minute over a maximum 44-inch drill stroke. Large diameter

(*Continued on page 652*)

• A new unit on the job, this Mack truck takes aboard three 8-yard loads of limestone on a side dump trailer equipped with Heil bodies and telescopic hoists.

CONSTRUCTION CAMP

Modern job methods have relegated to the limbo of the past the construction camps that provided such a colorful background for the lusty life of the old-time construction stiff. Author Bixby introduces us to some of the boys and takes us through a construction camp typical of those hardy days

By FLOYD SUTER BIXBY

DOWN IN Southern California's Coachella desert old-timer Hank McCarthy, a venerable gentleman whose experience in the excavating and construction business dates back farther than many readers of Excavating Engineer can remember, pointed with pride to a 12-yard dragline.

"Bixby," he said, "setting there is the last word in modern machinery. That machine, in decent digging, will excavate 15,000 cubic yards of earth per day." The big walking dragline swung over the levee and 12 more yards tumbled down the levee slope.

The old gentleman mopped his forehead with a clean handkerchief. "When I was a young man, Bixby," he went on, "yardage figures such as that were unheard of. We used mules and slips, and we measured dirt in hundreds of yards instead. This business is growing up, faster in its way than the machinery which made it possible."

He kicked a loose clod at the top of the bank, and watched it roll down the slope to the bottom of the canal. "But sometimes," he mused, "I wish that I could see with my own eyes once again a camp full of the type of men we worked thirty years ago."

I knew exactly what he meant. He meant that the construction game had lost much of its color which would never return. And I agreed with him, because many of the colorful things about the game were taken away directly as a result of the march of progress, because these things had no place in the new program. The living conditions in the early camps; the chances that were taken in the work, the money that passed over bars and gambling tables; these are all a part of the color which tinges the memories of every old timer who remembers the business as it was not so many years ago.

The old time construction stiff will never return. Social and economic conditions, hours of labor, efficiency and safety engineers, improved roads and many other agencies have conspired against him. Each year his number decreases. By and by he will disappear into the forgotten limbo of hard rock construction men.

While I talked over this change in men with Mr. McCarthy, my thoughts raced back to a small rock quarry on the Missouri River near Chamois, Missouri. It was a miserable, sloppy gray day in November, 1917.

The quarry was a mess. The last blast was about all a good shot should not be. Rock, some of it in boulders weighing ten tons, lay strewn over the Missouri Pacific tracks, and a labor crew was trying to clear the rails for a fast train nearly due. The powder monkey was one of those birds who loaded his holes by guess, by God and by instinct, tempering these measurements somewhat by the kind of a hangover he had. On this last shot his sights were plenty high.

"... a labor crew was trying to clear the rails for a fast train."

Meet Mike Marty

Sandy Donald, the quarry foreman, cussed under his breath. Damn! Of all the times in the world for this to happen, this was the worst. Mike Marty, his superintendent, one of the toughest on the river at that time, walked into the quarry and squatted down on a pile of spalls, biding his time before he turned Hell loose. All of this was not calculated to inspire joy in Sandy's heart.

Sandy had started a half dozen teams of mules hauling rock down to the dock barge on the river, and three of the teams were mired

down on the slick, muddy ramp leading into the quarry. Mike picked up a piece of pine board from the powder box and began to whittle nervously.

The three mule skinners lashed out with their reins. Throwing their weight into the harness, one team of mules sank deeper and deeper into the mud until daylight scarcely showed between the red clay and their black bellies. Mike could stand it no longer. He leaped to his feet and scrambled down the bank.

"Damn it, man," he screamed at the mule skinner, "ain't you never drove a team of mules before? Gimme them reins; I'll show you how to make them long-eared bastards climb that bank!"

Jerking the reins from the helpless skinner, Mike lashed out viciously at the mules until unmerciful red welts showed through the foam and slobber on their flanks. The team see-sawed until finally with a concerted effort they gave a mighty heave together, and the wagon began to crawl forward; too slow to suit Mike. Working himself into a frenzied "Marty fit" with which all the old-timers on the river are familiar, Mike dropped the reins, leaped astraddle a mule's neck and bit with his own teeth deep into the mule's ear to goad the team to greater effort.

During the years that followed, Mike slowed down a great deal. The last time I remember the toughness of the man was one hot July day in 1928, when he screamed himself hoarse that afternoon because two piledrivers, a clumper and a steamboat all went aground on a falling river. But these unrestrained fits of anger are disappearing from the construction business.

When Mike retired last year, he was a model overseer. He had changed in a number of ways. To say that Mike changed his ways because he realized somehow that the new ways were better would hurt his pride immensely, but in the interest of fairness I believe that it was so. The old fits of anger gave way to a personal interest on his part of anticipating trouble in advance, and correcting it then by mild conversations with his foremen. He instituted a safety program on his work which rolled up record after record. He raised the whole standard of the construction camp then in vogue and saw construction workers improve over and over again.

"... Mike dropped the reins, leaped astraddle the mule and bit deep into its ear."

I cite his camp particularly because here in his early days were the men and conditions which were typical of all kinds of construction, and which lent color to his particular camp. Mike saw a change in men put on his payroll, men with greater skill, higher intelligence and more specialized training than the old type of worker. The old-timers who still are there have absorbed many of the new ideas. The river and its development, which colored the writings of Mark Twain, ran the gamut of its growth here in this camp of Mike Marty's

"Specialists" Built Old-Time Mats

In the early days, most of the men who worked in the river construction camps were "floaters"; men without homes or families who came and went from job to job. Each of these men in due course of time worked himself up to some degree of proficiency in whatever part of the construction he followed. Bob Wilson, for instance, who worked on willow mats for various mat foremen up and down the river finally wound up on Mike Marty's fleet and earned quite a name for himself as a river-rat and a mat builder when he fell off the head end of the structure and swam cross-current for 90 feet, coming up on the downstream side. A feat such as this one automatically established for him an enviable status, for his superhuman deed furnished a subject of conversation for months afterward among the boys on the quarterboat.

Bob's brother, Josephus, specialized in piledriver work. One cold blustery day in March, Josephus fell off the head of a floating piledriver and swam with a crowbar in his hand until he reappeared far downstream, threatening to "drop this here crowbar unless you guys fetch the yawl down here to pick me up."

Mike lived to see the day when river reputations were not made by chance taking and blind luck. One winter when repairs were being made to his fleet, the decks of his piledrivers were coated with a non-skid protective coating which did away largely with piledriver

(Continued on page 654)

Brazil Block Strip Mine

A constant program of modernization is the theme as Big Bend Collieries, Inc., improves its Centerpoint, Indiana, property to meet increased consumer demand for its product

BIG BEND, a name long synonomous with coal and clay products in Indiana is gaining new fame as Big Bend Collieries, Inc., of Centerpoint, hangs up some neat production figures in working the largest Brazil Block coal area in the state. Installation of modern srtpping equipment and improvement of its preparation plant is enabling this organization to increase its output constantly.

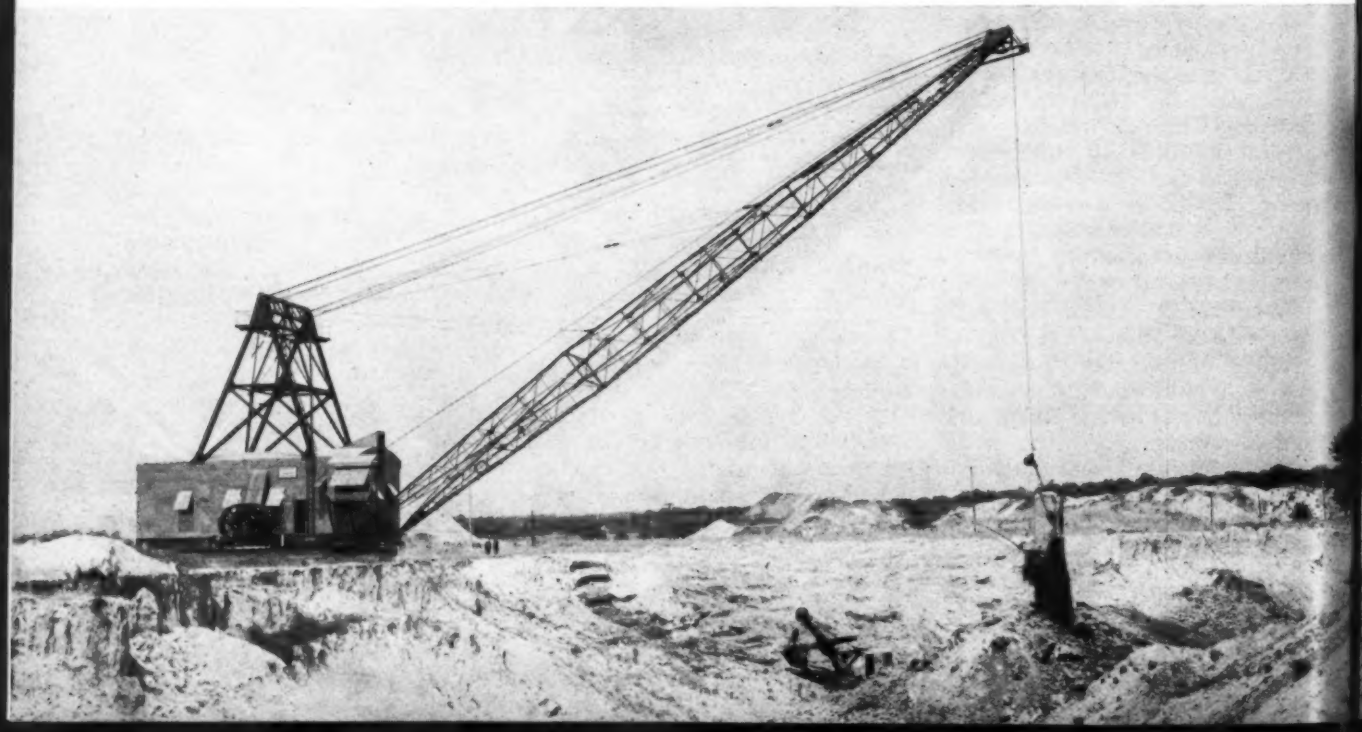
Working two strippings, Big Bend No. 1 and Big Bend No. 2, the present company is the consolidation of two local companies. Big Bend No. 1 was developed from the old Big Bend Coal & Clay Company property which was widely known as a source for excellent fire and terra cotta clays as well as coal. This property was purchased in 1939 by Eugene E. Munger, present treasurer of the Big Bend Collieries.

Big Bend No. 2 is on property that was owned by the Rockhill Coal & Clay Company, Frampton Rockhill, former head of the latter company, is the president and general manager of Big Bend Collieries, Inc. Other men on the company's executive roster are: Milton Goodman, vice-president; and Thomas W. Munger, secretary. George James wields the bookkeeper's pencil in the company's field office.

Improving Plant and Equipment

Covering an area of 1600 acres and faced with an estimated stripping job of some 124,000,000 yards, Big Bend Collieries has been carrying on a steady program of modernization in equipment and plant for the past two years. Since the replacement of their first old steam stripper with a 5-yard diesel-powered walking dragline, the company has steadily upped its production until it is now capable of producing 34,000 tons of coal per month.

The present flagship of Big Bend Collieries' equipment line-up is a Bucyrus-Monighan electric walking dragline. Swinging a 10-yard Red Arch bucket from a 170-foot boom, the machine is averag-



• Opening up a new section of the pit at Big Bend No. 1 was the first job for this Bucyrus-Monighan electric walking dragline swinging a 10-yard Red Arch bucket from a 170-foot boom. Note the Bucyrus-Erie 37-B coal loading shovel in the background cleaning up the pit floor.

• Top: Overburden at Pit No. 2 is cast aside by this 5-yard Bucyrus-Monighan diesel dragline working a Page bucket on a 120-foot boom. Center: A crew of men and an Allis-Chalmers tractor equipped with a Euclid blade clean and prepare the coal for the loading shovel. Bottom: Equipped with a special 2-yard coal handling dipper, this Koehring shovel loads out at Pit No. 2.

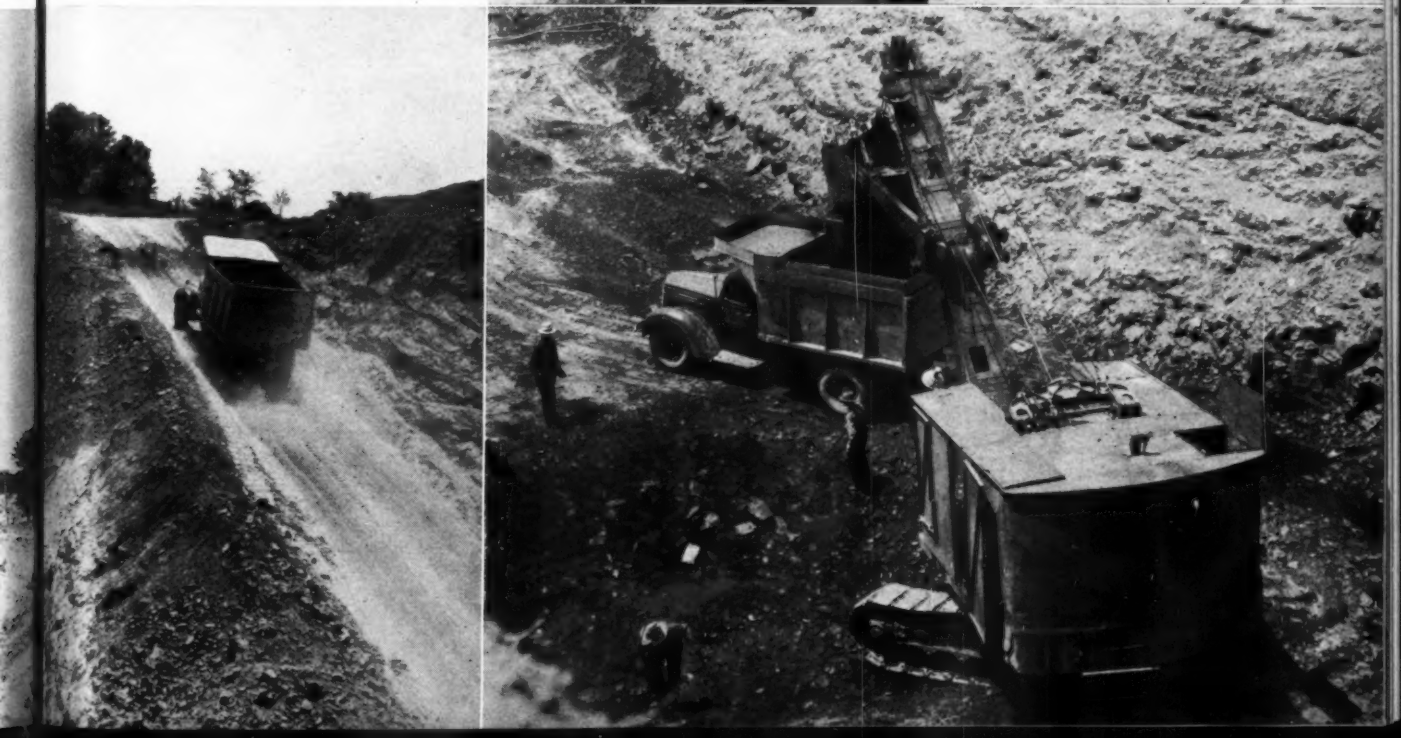
ing about 3,300-yards per 8-hour shift in overburden at Pit No. 1 varying from 35 to 55 feet. The coal vein in this area averages 30 inches in thickness and is topped by a tough, rugged shale for an average of 20 feet followed by a balance of sandstone, hardpan and ordinary surface material.

Powered by Westinghouse motors, the 10-yard dragline's performance enables Ralph Houk, general superintendent, to keep well ahead of the coal loading activities at Pit No. 1. The loading job at this pit is handled by a 2-yard Bucyrus-Erie 37-B which tosses out about 1,000 tons of Brazil Block coal per 7-hour shift. Cleanup work around the shovel and maintenance of pit hauling roads keeps an Allis-Chalmers-mounted Baker bulldozer busy.

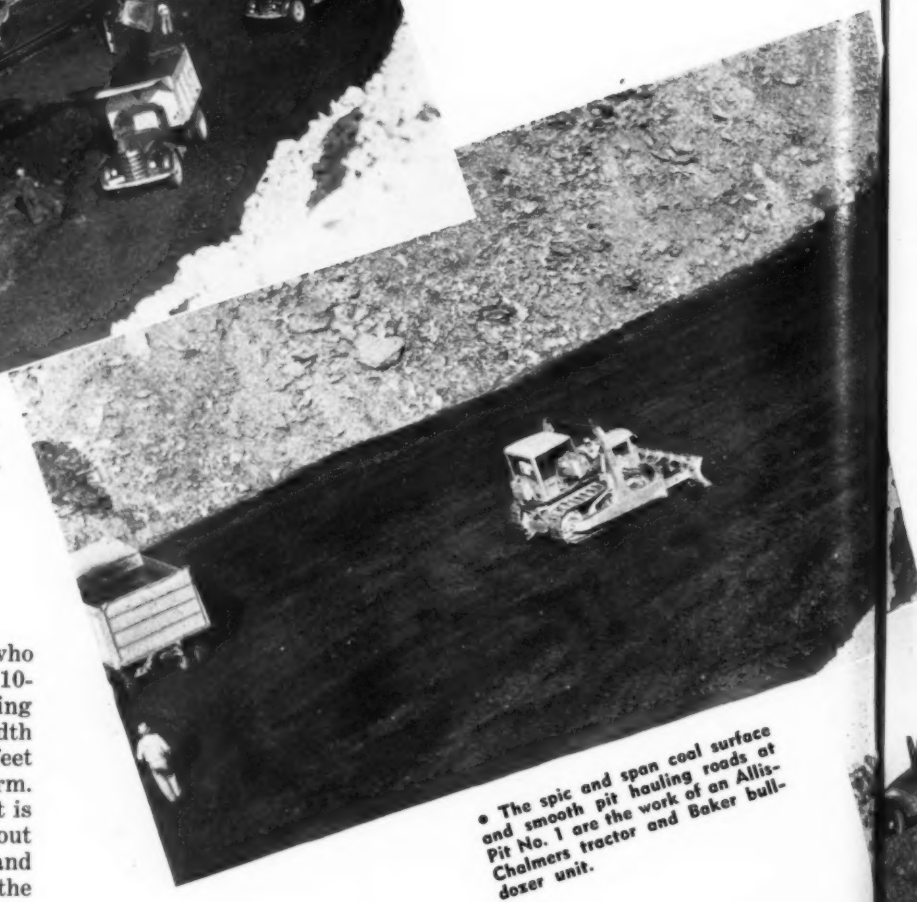
Hauling Is Subcontracted

Hauling at both pits is subcontracted by Big Bend Collieries to

• Below: One of Floyd Wells' International trucks leaves Pit No. 2 with a load of coal for the preparation plant.



• Coal loading at Pit No. 1 is handled by a 2-yard Bucyrus-Erie 37-B which tosses out about 1,000 tons of Brazil Block coal per 7-hour shift.



• The spic and span coal surface and smooth pit hauling roads at Pit No. 1 are the work of an Allis-Chalmers tractor and Baker bull-dozer unit.

Floyd Wells, Brazil, Indiana, who keeps three 15-ton and seven 10-ton International trucks rolling between pits and tipple. Pit width at No. 1 averages about 65 feet and trucks haul on a 14-foot berm. When the end of the pit circuit is reached, the berm is loaded out while the dragline turns and starts a new cut. The haul to the preparation plant varies between 2 to 3 miles over hard-surfaced public highways.

Unusually hard spots of shale and sandstone at Pit No. 1 call for blasting. An average shot of five 60-foot 4-inch holes put down by a McBeth gas-powered drill and loaded with Atlas powder provide a prompt solution for this problem.

Stripping and loading procedure at Pit No. 2 follows the same routine on a smaller production scale. Here, a 5-yard diesel powered Bucyrus-Monighan walking dragline swings a Page bucket with built-up sides from a 120-foot boom as it removes 30 to 40 feet of overburden above a Brazil Block coal deposit varying from 2½ to 3 feet. In present going, which means some pretty rugged shale, the dragline is averaging about 1,500 yards per 8-hour shift.

Loading duties at Pit No. 2 are performed by a Koehring shovel equipped with a special 2-yard coal handling dipper. Coal clean-up and pit road maintenance call for the services of an Allis-Chalmers tractor supporting a Euclid 'dozer blade.

Drainage is not much of a problem at the two pits, but whenever the need arises, the nearest machine is assigned to dig necessary ditches. Six Barnes pumps in 3-, 4-, and 6-inch sizes are ready to be used when needed.

Employing a total of 100 men, Big Bend Collieries, Inc., is working at a 3-shift 7-day week clip these days. Stripping shifts are 8 hours long, while loading forces work a 7-hour shift.

All stripping and loading machines at Big Bend Collieries use American Steel & Wire Company ropes. It is interesting to note that the Bucyrus-Monighan 9-W changes hoist ropes every 90 days while drag ropes serve for 30 to 40 days. Rope life on the 5-yard Bucyrus-Monighan dragline at Pit No. 2 is about 120 days for hoist lines and 60 days for drag cables. Sinclair lubricants are used on all machines.

Preparation Plant Procedure

At the time of the writer's visit, the tipple for Pit No. 2 was undergoing repairs and changes and so was closed. However, the newly

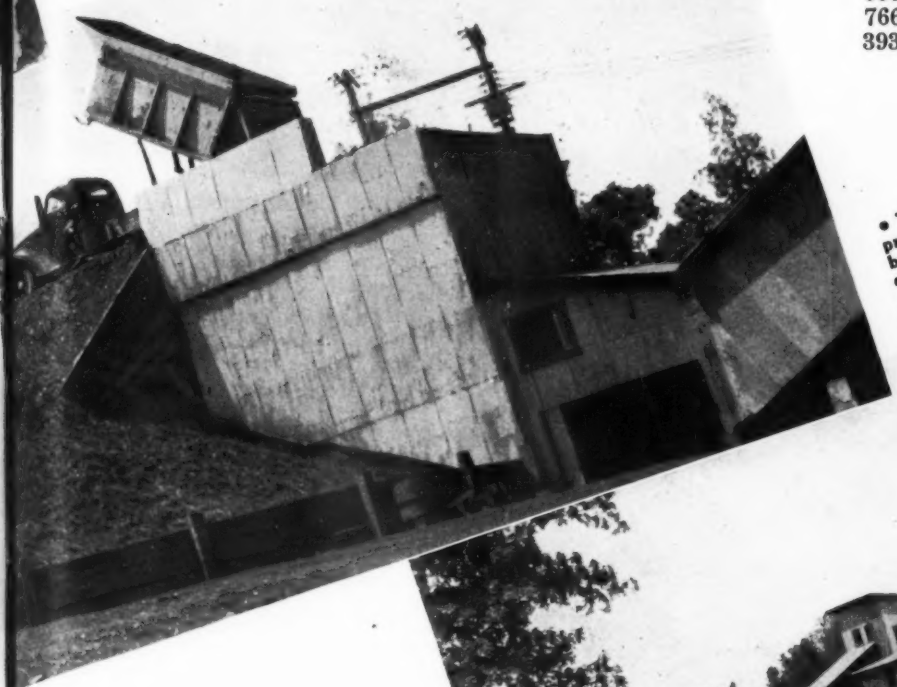
modernized tipple and preparation plant at Pit No. 1 was taking coal from both pits in full stride.

Built to load on four tracks, the preparation plant breaks, cleans, and sorts the raw pit coal into a 6-inch domestic block, 3 sizes of egg and a modified screening for stoker use. Trucks dump their loads from a platform into a 50-ton hopper feeding a drag conveyor loading up to the preparation plant's main shaker screen which sorts the coal into the five sizes already mentioned.

A 24x48 single-roll McNally-Pittsburg breaker is on hand for further crushing and loading when desired. Dust proofing of the final product is handled by a Simplicity vibrating screen installed for dedusting screenings at 3/8-inch, the resultant 3/8-inch carbon going to a storage bin from which it is trucked to a separate loading ramp above the tipple. This material is sold as a "blow in" fuel for certain types of heating plants. A straight dust proofing oil treatment is also available for all sizes.

Deposits of excellent fire and terra cotta clay just under the coal vein on the Big Bend Collieries property form another potential product for the company. However, today the main objective of men and machines at Big Bend Collieries, Inc., is to keep those coal cars rolling out on the Pennsylvania Railroad as John Citizen fills his coal bins for a warm, cozy winter.

• At present, coal from both pits is truck-hauled to this platform where it is dumped into a 50-ton hopper that feeds the preparation plant.



• The newly modernized tipple and preparation plant for Pit No. 1 breaks, cleans, and sorts raw pit coal into various commercial sizes and loads it to railway cars on four tracks.

Uncle Sam Has Most Highway Mileage

Roads in the United States of 3,065,000 miles in length at the end of 1940 greatly exceeded the total of any other country, but the area of such roads in square miles is less than recorded for Canada, China, Brazil and the Union of Soviet Socialist Republics, according to the U. S. Department of Commerce.

A survey of the highways of the world issued as a part of the Industrial Reference Service, an information service of the department, said that highway construction and the improvement of lines of communication are in some countries considered as matters of strategic military importance and highway data is not released.

Gibralter with only 25 miles of road has the smallest total of any of the 151 geographic areas reported upon in the survey.

Principal countries in point of road mileage include the Union of Soviet Socialist Republics, 1,682,000; Canada, 599,040; Japan, 591,766; Australia, 488,749; France, 393,761; and Germany, 263,267.

FILLING A RUSH O

The job of furnishing 500,000 tons of aggregate in a hurry for the U. S. Army's 800-acre Jefferson proving ground near Madison, Indiana, is neatly handled by Standard Materials Company of Indianapolis

FILLING AN ORDER for 500,000 tons of assorted aggregate is a man-sized order for most any organization, especially when that order is marked RUSH by Uncle Sam!

That's the sort of job Standard Materials Corporation of Indianapolis, Indiana, tackled this summer when it contracted to furnish the Army's Jefferson proving ground with 115,000 tons of washed and screened gravel, 185,000 tons of pit run material and 200,000 tons of oil stabilized gravel. The 106-square mile proving ground located eight miles north of Madison, Indiana, is one of the largest in the country.

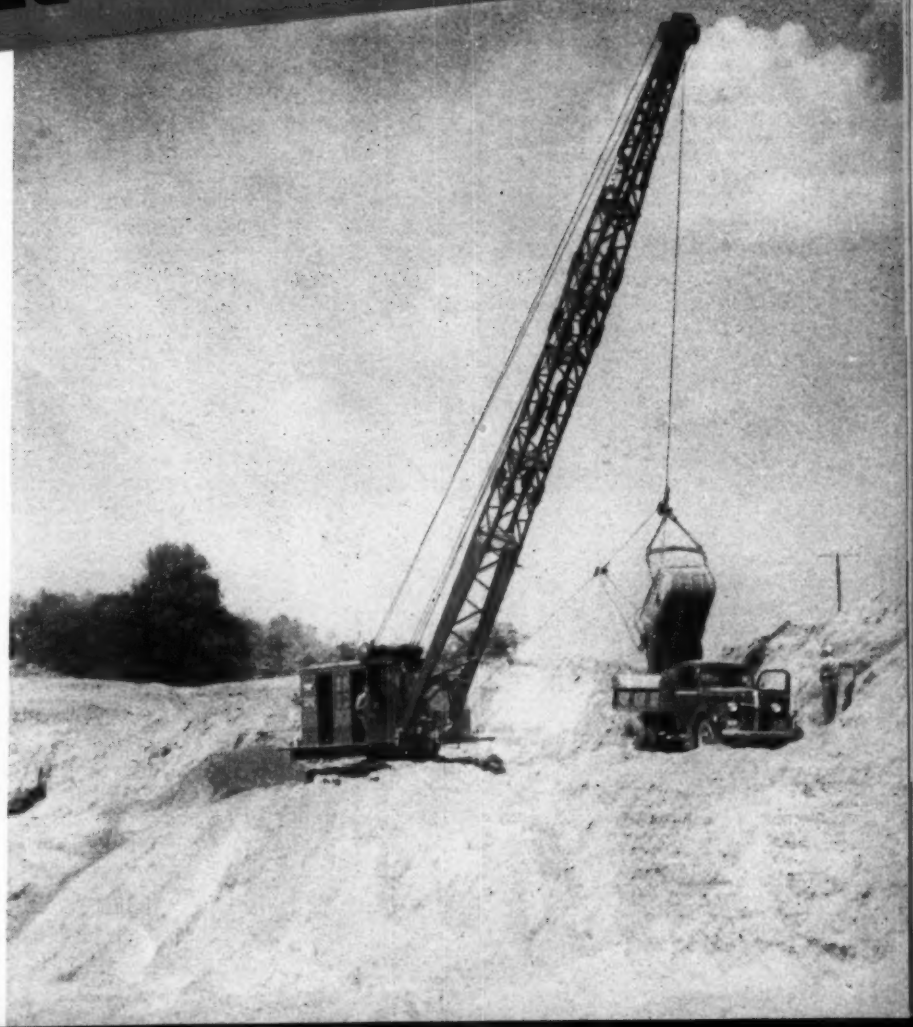
Averaging 6¼ miles in width and 17 miles in length, the area will serve as a testing laboratory for army planes, tanks, guns and ammunition. The aggregate furnished by Standard Materials Corporation is being used in building construction, airport runway basis and various types of roads in the area.

• **Top: Pit run material is loaded to a hopper feeding the crushing and screening plant by Standard Material's Bucyrus-Erie 54-B dragline equipped with a 3-yard bucket and 80-foot boom. Bottom: General operations view at Hanover showing the pit worked for the crushing and screening plant. In the background are the coarse gravel pit operations.**

DER FOR UNCLE SAM

• Top: Fed by a 220-foot 30-inch belt conveyor, this aggregate separating and cleaning plant produces sand and three sizes of gravel from the pit run material. Bottom. The company's Bucyrus-Erie 37-B loads out coarse gravel direct to trucks bound for the Jefferson proving ground.

Leasing an old state highway gravel pit just out of Hanover, Indiana, Standard Materials moved in men and machines and really started to dig a hole. The sandy clay overburden on the property varies from 5 to 12 feet and strikes an average of about 8 feet. The top soil was peeled off ahead of the operations by a Caterpillar RD-8 powered 12-yard LaPlant-Choate scraper and a Caterpillar D-7 towing an 8-yard LeTourneau scraper. The latter unit is still kept busy on the job removing overburden in advance of the ever-widening pit. A county road relocation necessary to develop the gravel pit area, received most of the preliminary spoil.



Located on the bank of the Ohio River, the deposit leased to Standard Materials is a natural storehouse of uniform, hard, dense gravel. Tests as deep as 90 feet have indicated pay dirt all the way down.

Under the supervision of genial H. E. "Herb" Brown, production manager of the company, 51 men have been working two 8-hour shifts per day to keep up the all-important flow of aggregate to the proving grounds. Two Bucyrus-Erie draglines, a 54-B and a 37-B, are moving the dirt on the job. At the time of the writer's visit, the 54-B was working in the deepest level of the pit, loading direct to a hopper feeding the main crushing and screening plant. The 3-yard Red Arch bucket swinging from the 80-foot boom kept the hopper filled with ease.

(*Continued on page 658*)

Don't Short Change

The author, a public accountant who has served many contractors, points out the importance of an accurate depreciation estimate in computing operating costs as well as taxes

By ARTHUR ROBERTS

WHY SHOULD WE increase operating costs with depreciation charge-offs on new equipment when our old equipment is in good shape?", asked the superintendent of a road construction company almost belligerently when approached to modernize the company's working equipment. His query, typical of many others the author has heard, signifies an erroneous state of mind prevalent among some excavating men who dislike to replace old equipment with new because it means increased annual charges for wear, tear and obsolescence, or, as is sometimes the case, the old equipment in use carries no depreciation expense because it has been written down to scrap value in prior years. It also signifies the need for better synchronization with the facts, otherwise, modernization will not be effected when such a course is most desirable and, with the excavating industry now in high gear under the stimulus of Uncle Sam's defense program, it is imperative that all excavating men inventory their mechanical equipment now with a view to replacing the "weak sisters." A machine must be in tiptop condition to stand the gaff in the days to come.

Probably no other element of operating cost has been covered in so many different ways as depreciation. Books, tracts, articles and speeches have sought to clarify this moot subject but the waters are still muddy for many. During many years experience with the accounts of excavating companies we have had plenty of opportunity to study depreciation as it affected this industry and we shall discuss its fundamentals in a manner, simple and understandable, so that excavating men, with the basic factors clear in mind, will be better able to handle it accurately.

Three Classifications of Depreciation

For easy assimilation, depreciation may be divided into three main classifications: (1) its purpose; (2) its computation; and (3) its handling from an accounting standpoint. We will elaborate on these classifications in the order named.

The purpose of depreciation is twofold: (a) to include the depreciation charge in equipment expense so that the cost of the machine, pro-rated over its life, may be recovered in the prices charged for service; (b) to record gradual decreases in equipment values. In field studies, the author has found too many cases where excavating men fail to charge off any depreciation at all, assuming that since their equipment is paid for, these charge-offs to profit, which are internal transfers, hence, mere bookkeeping entries, will not affect current income or net worth. But, the omission of depreciation from equipment expense makes the business short-change itself because customers do not pay enough for service. Eventually, this amounts to the same thing as giving away the cost of the equipment in short selling prices.

For example, one excavating man was figuring $120 as the expense per working month for a motor grader that cost him $3,600. Service prices were computed on this cost. Investigation disclosed that he was not considering de-

• The original cost of this Bucyrus-Erie dragline divided by its useful life is the best method of figuring its annual depreciation charge. Owned by the Imperial Irrigation District, the machine is shown digging an irrigation ditch in hard soil near Imperial, California.

urself!

• A Caterpillar tractor equipped with a LeTourneau bulldozer relocates a county highway near Elmira, Oregon, for the Lane County Road Department. Careful depreciation records on equpiment of this type are necessary for profitable operation.

preciation in this equipment expense. The grader should have been depreciated at 20 per cent yearly, which would have increased the expense per working month to $210, figuring on eight months' operation as average for the year. He was losing $720 yearly in depreciation expense and short-changing himself that much when computing charges for customers. It is easy to give away profits if depreciation is figured inaccurately. An analysis of the record of 281 eastern companies disclosed that depreciation averaged 5.6 per cent of sales. Net profits, for the same period and same companies, averaged 5.8 per cent of sales, which shows that depreciation is an important factor in such fields as excavating where the equipment used runs into big money. Depreciation should be watched as carefully as the net profit on sales or investment. The other reason why depreciation should be charged off yearly concerns its reduction of asset value. Machinery, fixtures and buildings depreciate from wear, tear and obsolescence. By making annual charges for depreciation, the management reflects this toll because it reduces asset values yearly. The fact that cash is disbursed in a previous year for machinery is no reason why each subsequent year in which it is used should not bear a proportionate part of the outlay. Whether a machine is bought for cash or on installments has nothing to do with the depreciation charge, neither is the charge limited to the year of purchase. As to net worth, it is inflated, if the machinery or other assets are shown at original cost indefinitely. Too many concerns in this industry have old equipment on their books at original cost prices, whereas, it is worth little more than scrap value and should be modernized. Their statements show a bloated net worth because they have never written down their working assets with annual depreciation charges or have been figuring too little depreciation.

Remember that the computation of depreciation is always an estimate. There is no way to calculate it to the penny. Other costs can be reduced to dollars and cents but not depreciation. We have never known a case where the depreciation charges at termination of the write-downs have equaled the original cost on the books, whether or not salvage or trade-in value was considered. Nevertheless, care should be taken in setting a rate that will approximate wear and tear as accurately as possible, thus reducing the hazard of loss. Over-depreciation increases equipment expense and may increase your price to customer above the average, killing sales. Under-depreciation tends to make your selling prices too low for safety or it may mean payment of dividends out of capital.

Methods of Computation

"How do you compute a fair rate of depreciation?", is a question frequently asked by excavating men. There are 10 methods of computing depreciation. All recognized methods may be used by the same company. Considerable confusion exists because of the different methods of computation. Excavating men have frequently asked us to explain the various methods, usually because they imagine that a method other than they are using will enable them to reduce equipment expenses. The writer has done extensive work on all 10 methods and finds that only four can be recommended for the excavating industry.

1. The straight-line method of depreciation. The original cost of the machine divided by its useful life, the result being the annual depreciation charge. If a roller worth $4,800 has a profitable life of eight years, the depreciation charge is $600 yearly. If the average use months per year is eight, the monthly depreciation charge is $75 to be figured in the expense per working month.

2. The reducing installment

method. The heaviest charges falling during the early years of equipment use on the assumption that a machine is second-hand in three months and would sell for half its cost. This reasoning is unsound, it seems to us, although some authorities favor it, but depreciation measures the service of a machine, not its market value. The average business must be considered a going enterprise and its operating expense handled accordingly. Then too, this method will swell costs and selling prices abnormally during the early years of use. However, this method may be worth consideration from the standpoint of expense-equalization. During the early years of equipment use, repairs and maintenance are low. In later years, this expense mounts. By loading the early years with heavier depreciation charges, this tends to equalize the equipment expense over all years.

3. The appraisal method. A physical check-over of all equipment to determine its worth, not in terms of remaining normal years of service as per depreciation schedules but with regard to actual condition. Even where another method is used, all depreciation accounts should be checked at least once yearly to determine how closely appraised value lines up with book value.

4. The job charge-off method. Charging off so much depreciation per job. This may work out satisfactorily if the equipment is always in use but if equipment is idle part of the time, insufficient depreciation may be charged during its life. The author has known of a number of cases where as much as 30 per cent of equipment value was still on the books when it was scrapped. The job charge-offs were insufficient because the equipment was idle a large part of the time. Customers got the benefit in low prices.

Consider Profitable Operation

All in all, we find that the straight-line method is the most satisfactory. It is simple and safe. Moreover, the U. S. Treasury Department recommends it and 90 per cent of the business organizations in this country, from the corner grocery to the Croesus utility, use straight-line depreciation. In making the estimate, remember that you must consider profitable life, usefulness or capacity, not mechanical life. An old machine may be in good condition mechanically but be unprofitable to operate.

A certain contractor was using an old, obsolete compressor, justifying its use by the fact that its estimated life, as per the books, had a few more years to run. He averaged 300 cubic yards of rock excavation a day with full equipment going, much of which was new but he wasn't considering the drag on his drills, shovels, trucks and bulldozers because the old compressor could not keep up air pressure to pace his newer equipment. The writer estimated that he could have increased output by 100 yards with a modern compressor. At $1 per yard, this would be $100 a day extra. The compressor was mechanically passable and economical to operate, but being old and obsolete, it could not turn out a top volume of work. The depreciation charges had been geared to the mechanical limit of the equipment, which was beyond profitable life. Scrap or trade-in value cannot be considered when fixing the depreciation charge. When the equipment is eventually scrapped or traded-in, an adjustment accordingly can be made on the books, but in most cases, this value is nominal unless the asset is fairly new and traded in for a larger unit before it has lived its profitable life span.

Depreciation varies with the machine or groups of machines. It

• Excavating sand and gravel for the U. S. Public Buildings Administration's defense housing program at Indian Head, Maryland, keeps this Lorain shovel busy these days. An accurate service record will be important when it comes time to figure obsolescence. (Public Buildings Administration Photo)

• A portion of the tractors and grading equipment employed on the government's defense housing project at San Diego, California. A picture like this gives some idea of the importance of an accurate cost record on each unit in estimating the obsolescence of an entire equipment line-up. (Public Buildings Administration Photo)

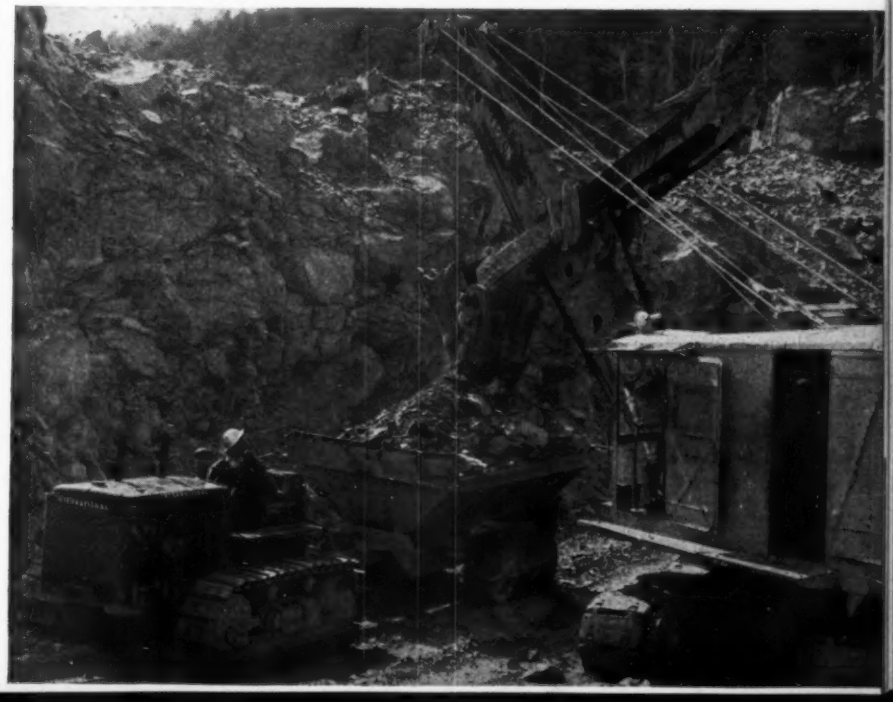
is unwise to average a rate for all machines. The management should keep a record of each machine, its age, cost, depreciation schedule and present value, making a periodical survey to determine if book value approximates actual appraisal value. The care given machinery is a factor. Unless you keep your machinery in good condition, it may depreciate more rapidly than estimated. Obsolescence, in some cases, complicates the write-down because a machine may grow obsolete before it wears out. The continuity of profitable operations is best assured by scrapping obsolete equipment to maintain proper production.

Never increase the original cost of an asset. Its market price may increase but this does not warrant the taking of appreciation. The tendency will be for machinery prices to rise with business uplift but users should not increase book values to reflect this condition. This would automatically increase the annual depreciation charge and may raise costs unduly.

Finally, we come to the third classification of depreciation: its handling from an accounting standpoint. It is distinctly an internal charge because there is no outlay of funds in crediting a reserve for depreciation. The road builder or excavating contractor will do well to check over the reserve accounts covering machinery and buildings to determine whether the accumulated depreciation lines up with actual wear and tear.

Depreciation is the measure of the loss of property utility and value consumed in equipment operation, which should find its way into operating costs, so that it is recoverable in the selling prices. It is current value consumed, a loss to the owner that should be repaid by the customer. It is a very important cog in the business of this industry. See that your depreciation expense is adequate and that your old machines are replaced with modern units when they have depreciated below profitable-use levels.

• Loading and hauling equipment is the major item in most operation costs. Here, a Marion shovel loads out asbestos rock to an International-towed Euclid wagon at the Vermont Asbestos Mines near Eden.



A Tip to Haulage Men

According to a recent court decision, excavating contractors are liable for dirt falling from trucks moving along hard-surfaced public highways and must do one of these things. The choice is as follows: (1) Load the trucks so that dirt will not fall onto the highways. (2) Sweep it away before it turns into slippery mud that will imperil highway travelers. (3) Stand liable if some carefully driven vehicle skids off the highway because of the muddy condition.

An Ohioan won a $2,500 verdict against a highway contractor, for injuries sustained in the nighttime when a car skidded off a road. A jury found that the accident was directly due to dropping of dirt on the road from the contractor's trucks—dirt that turned into mud when it rained.

In vain did the contractor's lawyers argue that the blacktop surface of the road was worn and slippery and that the accident would have happened even if there had been no dirt on the surface. The court said that that was a question for the jury to decide, who in turn blamed the accumulated mud on the highway. Moralizing, generally, the court said:

"It is highly important that the highways of the state be kept in safe condition for travel, and if contractors are obliged to haul dirt over the highway they should exercise care and see that such operation does not render driving dangerous. This may require them to be more careful in loading trucks or more cautious in removing drippings, which might cause a slippery condition after a rain."

How Priorities Work in Construction

"How can I get tools and material?" is the No. 1 question of construction today. The following simple and understandable account of Uncle Sam's methods of equipment and material control is well worth reading

By ROBERT B. COLBORN

Reprinted from Engineering News-Record, October 23, 1941

A FEW WEEKS AGO a group of oil companies decided to build a pipe-line from Texas to New Jersey, at a cost of about $70,000,000. They made arrangements to get money. Congress passed a special law to help them condemn rights-of-way. Everyone agreed on the need for additional oil transport to the East Coast. No major technical problems stood in the way. It was a gilt-edged project.

Today, however, no pipeline is under construction. The plan has been deferred, probably abandoned. And for just one reason. Seven men—the Supply, Priorities, and Allocation Board—had decided that steel plate could not be spared from shipbuilding to fabricate the pipe.

Week by week, the handling of priority problems is becoming a larger part of the construction man's job. Questions like "Can we get the material?" or "Can we get a rating?" are assuming the same importance in planning projects as "Can we get the money?" The simple fact is that as a result of the demands of munitions manufacturers there just aren't enough materials or machines in this country to make all the things that people want. Clearly, the stuff that's available has to be divided up and put where it will do the most good. The "priorities system" is the mechanism by which this is being attempted.

Under laws passed since the defense program started, the President can give orders to any firm as to what jobs it shall do first and what deliveries it shall make first. This power is exercised by the Priorities Division of the Office of Production Management under the general supervision of the new Supply, Priorities and Allocation Board. Donald Nelson is administrator of the Priorities Division and executive secretary of SPAB.

The priorities system has a vast number of things to do—all the way from indicating which wool blankets shall be manufactured first to distributing the monthly production of aluminum. Inevitably, therefore, a multitude of varying forms and procedures have developed. And they are constantly changing. Anyone using priorities has got to keep in constant touch with what is going on in his field. But fortunately nearly all priority actions are variations of a few broad types, and an understanding of these will simplify the problem.

What is a priority rating?

The simplest — and originally the only — form of priority document is a preference rating attached to an order for goods or services. This is a piece of paper, signed by the director of priorities, compelling the firm which receives the order to accept it and to make delivery by the scheduled completion date—even though the firm has to delay other orders. Preference ratings are of varying degrees of urgency, as indicated by a numerical designation ranging from A-1, the highest, to A-10. Because of the tendency to give too many orders an A-1 rating, this has had to be subdivided, A-1-a, A-1-b, . . . A-1-j. In the past, B ratings have occasionally been used to indicate the relative importance of different non-defense orders, but at present these don't mean very much.

A manufacturer of, say, power shovels who has a number of orders with different ratings is supposed to make deliveries on all of them on the delivery date specified in the order. If he can't do this, he delays delivery on the lower rated orders and makes the high rated deliveries on schedule.

Purchase orders placed by the Army or Navy for scarce items automatically carry a preference rating. The Priorities Division has turned over to the Army and Navy Munitions Board a lot of blank priority forms, already signed by the Director of Priorities. When an Army or Navy purchasing officer buys something, he simply fills out one of the forms and attaches it to the order.

Of course the Army and Navy isn't allowed to do this every time they buy a dozen pencils, or the country would be flooded with priority ratings. Purchasing officers may use priority ratings only when they buy something scarce. A list of some three hundred scarce items has been compiled, called the Priorities Critical List. This list is revised monthly.

Obviously, too, it can't be left up to the individual purchasing officer to decide what rating shall be attached to the things he buys, or every order would be A-1-a. Therefore, the Army and Navy Munitions Board has drawn up a set of directions, called the Priorities Directive, telling what rating shall be given to different types of orders. Thus, for instance, the directive will say that goods to be used to modernize existing airports rate A-1-b, goods to be used for troop housing rate A-1-j, etc.

Construction supplies

This same system applies also to orders placed by construction contractors doing work for the Army or Navy. A priority rating can be attached to the order by the military representative on the job.

Suppose, for instance, a cantonment contractor wants to buy a bulldozer for delivery Nov. 15. The constructing quartermaster on the job looks at his Priorities Critical List and sees that bulldozers are included on it. He looks at the Priorities Directive and sees that a rating of A-1-j is in order. He therefore fills out a preference rating form with this rating and attaches it to the order for the bulldozer.

The bulldozer manufacturer might already have in his shop an order rated A-3, calling for delivery Nov. 1. If possible, he will

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make delivery on both orders on the scheduled date. It may be, however, that he is so crowded with work that he can't fill both orders on time. In that case he would delay the A-3 order, perhaps, until Nov. 10, perhaps even until Dec. 1, in order to deliver the cantonment contractor's bulldozer on Nov. 15.

Extension of ratings

In order to build the bulldozer, the manufacturer has to buy an engine, and it may be difficult to get one soon enough to fill the cantonment contractor's order on schedule. He needs a priority rating on his order for the engine. To get it, he "extends" the rating attached to the bulldozer order. That is, he fills out and signs a statement that he needs delivery of the engine on, say, November 11, in order to fill a Nov. 15 order for a bulldozer bearing a rating of A-1-j and that he is therefore attaching an A-1-j rating to the engine order. This statement must be countersigned by an Army or Navy official—perhaps the inspector in the bulldozer plant, if there is one, or perhaps the constructing quartermaster on the cantonment job.

In the same way, the engine manufacturer can extend the rating to an order for carburetors to go into the engine, and so on down the line.

Ratings can only be extended in this manner to items on the critical list.

Civilian defense orders

Many orders of defense importance are not placed by the Army or Navy. The bulldozer for instance might be needed in the construction of a shipyard for merchant ships or to build a privately owned machine-gun factory. In this case the buyer must apply directly to the Priorities Division in Washington for a rating. A special form is available for this purpose. The application may be addressed simply to the Director of Priorities or it may be directed to the branch of OPM having jurisdiction over the particular problem involved. The organization of the Priorities Division will be discussed later.

With one important exception, ratings obtained in this manner can be used in the same way as those coming from the Army and Navy. Exception is that these ratings cannot be extended. If the bulldozer manufacturer wants a rating on his engine order, he must make out a new application to the Priorities Division. The application, of course, would draw attention to the fact that the engine is needed to fill a priority order for a bulldozer, and issuance of the rating would be pretty certain.

Application must also be made to the Priorities Division when it is desired to attach a rating to an Army or Navy order for an item not on the Critical List or to depart in any other way from the established procedure.

A considerable number of forms have been developed for handling this system, and there are several with which everyone should be familiar. These are known as PD (standing for Priorities Division) forms, and priority ratings attached to individual orders are frequently referred to as PD ratings. Form PD-1 is the form used in making application for a rating to the Priorities Division. Ratings are issued by the division on a PD-2 form. Ratings issued by the Army or Navy are put on a PD-3 form.

Project and blanket ratings

This system of PD ratings evolved last year under conditions in which scarcity was the exception rather than the rule and when it was desired to hold priority control to a minimum. As recently as last May, most priorities still fitted into this scheme. But now it is chiefly used as a trouble-shooting device, and priority control is mainly exercised through other means.

As the country moved farther into a war economy, more and more things became scarce, and at certain points the burden of attaching individual ratings to every order needing one became overwhelming. Thus a machine tool manufacturer would find that every order in his shop bore a rating, and that his own orders for steel or motors would be enmeshed in a chaos of different ratings. Similarly, a construction contractor would have to attach ratings to nearly everything he bought.

To meet this problem, the device of the "project" or "blanket" rating was developed. This is a document which consolidates into one all the ratings to which a particular project or manufacturer is entitled.

Project ratings are of a good many types, each type being designated by the letter P and a number. The type used for construction is the P-19 order. Each order issued bears a serial number and authorizes the recipient to apply a particular rating—A-1, A-3, or whatever—to certain of his purchases. Under a P-19 order, the rating may be applied to all purchases of items on the critical list. Some other P orders contain a list of particular materials to which the rating may be applied.

To use a P-19 order, the contractor sends to each of his suppliers a signed copy or photostat of the order. Then to each subsequent purchase order he attaches a memorandum saying that under Priority Order P-19, serial number so and so, the purchase order is entitled to a preference rating of such and such. The supplier may use the same procedure to apply the rating to his suppliers.

P-19 orders are issued by the Army and Navy Munitions Board to construction contractors holding contracts from the services. Special arrangements, to be discussed later, have been worked out to facilitate the issuance of P-19 orders in connection with house construction — public and private—and road-building. Similar plans are in preparation for municipal and state construction.

In all other cases project ratings are issued directly by the Priority Division of OPM. No special application form is used. A detailed letter should be sent to the director of priorities, describing the project with some fullness, explaining its defense importance, stating, on what materials procurement difficulties have been experienced and what efforts have been made to obtain them, and giving the names and addresses of suppliers used.

Holders of project rating orders will ordinarily not have to make much use thereafter of individual

AFTER 50,000 MILES—

LIKE TO SEE A CLEAN ENGINE—free rings, perfect bearings—next time your Diesel equipment is due for inspection?

Then take a tip from Washington Motor Coach Company, who put their new coaches, powered with General Motors Diesels, into service with RPM DELO last December. On their grueling runs, these coaches encounter every kind of tough going, every type of weather. Yet, after 50,000 miles each, the only attention the motors needed was a *look!*

"Valve stems were free in the guides, rings were free, pistons and all crankshaft bearings in excellent condition," says W. W. Churchill, Superintendent of Operations and Maintenance. These coaches have now traveled more than 80,000 miles each and still give "highly satisfactory service"!

No wonder Washington Motor Coach Company chose RPM DELO again when seven additional coaches went into service this year! And no wonder we say—use RPM DELO in *your* Diesel equipment—*regardless of make, size or type.* SEE how it lowers maintenance costs, boosts operating profits!

ORDER RPM DELO
Unequaled
FOR YOUR DIESELS

Approved by the makers of over 95% of the installed Diesel horsepower in America, RPM DELO is marketed under the following names:

RPM DELO
Kyso RPM DELO
Sohio RPM DELO
Signal RPM DELO
Caltex RPM DELO
Imperial-RPM DELO
CONCENTRATE

Ask your Diesel engine manufacturer or distributor for the RPM DELO supplier in your locality.

RPM DELO
REG. TRADE-MARK
DIESEL ENGINE LUBRICATING OIL

STANDARD OIL COMPANY OF CALIFORNIA

For your convenience in writing to Standard Oil Company of California, you will find a card bound in this issue.

PD ratings, but they are still available as a troubleshooting device. Thus it might be found that a rating was needed to buy some item not on the critical list, or again the rating given in the P-19 order might not be high enough to get prompt deliveries on some particular item. In such cases application can be made to Priorities Division on a PD-1 form for an individual rating on that particular order.

Repair and maintenance

Somewhat similar to project ratings are the repair and maintenance ratings. Inescapably, war is restricting the supply of civilian goods and equipment. But it is realized that if the country is to keep running, existing equipment and facilities must be maintained in good repair. Therefore priority aid is being given in meeting repair and maintenance needs. This is the simplest to use of any type of priority.

Under this plan, a list of important services and industries is established, and organizations included on the list may attach an A-10 rating to their orders for maintenance supplies. The list includes: all public highway maintenance; all common, contract, and private carriers of passengers and freight; manufacturers of highway maintenance equipment; shipyards and ship repair yards.

An eligible organization need make no application for the use of this rating. In placing orders for maintenance and repair needs, it simply attaches to the order the following statement: "Purchase order for repair or emergency inventory—Preference rating A-10 under Preference Rating Order P-22."

Under a variation of this plan, public utilities — electricity, gas, water, steam, or sanitary services — may use an A-10 rating not only for repair and maintenance purchases but also for operating supplies. The same procedure is used except that reference is made to Preference Rating Order P-46. Also, utilities must file with OPM a statement promising to hold inventories to a minimum and not to apply the rating on purchases of greater quantities than they used last year. In case of breakdowns resulting in stoppage of service, utilities may make telegraphic application to the Priorities Division for an A-1-a rating on emergency repair parts.

Allocation of materials

Common to all the types of priority control so far discussed is the fact that they start with the finished product. What the government does, esssentially, when it hands out individual or project priority ratings, is to indicate relative degrees of urgency of various goods and services. It tells industry what things it particularly wants done and then leaves it to the more or less automatic workings of private management to effect the necessary scheduling through all the stages of producing, fabricating, and assembling raw materials.

Since last March, an entirely different kind of priority control has been developing alongside the system of ratings. This plan, generally known as allocation, starts at the other end with the raw material. The government tells the producers of, say, aluminum that so many pounds shall go this month to that airplane producer, so many to that foundry, so many to that ship-builder. Next month, the government will furnish a new schedule. When these schedules conflict with priority ratings, the schedules govern.

Priority by allocation represents a much greater degree of government control over industry than does priority by preference rating. With allocation, the government assumes an active voice in the detailed operating decisions of management — becomes, as it were, the production superintendent in every plant. With war enforcing tighter and tighter government regulation of industry, allocation is occupying an increasingly important place in priority control.

Priority Director Donald Nelson says that allocation will soon become the most common form of control. He suggests that it may be applied from the finished product end as well as the raw material end. This would mean that instead of a priority rating, defense and essential civilian industries would be given a certain poundage of material. Something of this sort has already been done in the defense housing priority plan. Here, OPM decided to let house-builders have enough material to build 200,000 houses. The ratings being given to builders merely evidence their right to participate in this pool.

At present, all metals except the precious ones are under allocation, as are rubber, cork, silk, manila fiber, and a long list of chemicals. And the number of materials covered lengthens every day.

Construction men, to date, have not been much affected by allocation procedures. In general, these procedures govern the relations between metal producers and metal fabricators, while construction is a consumer of fabricated metal. However, the growing importance of allocation is such that every one dealing with priorities should understand it.

Materials are brought under allocation by so-called M (for Material) orders, each dealing with a particular material. Thus M-1 governs the distribution of aluminum, M-9 that of copper, M-21 that of steel. The orders differ widely in detail, but each asserts the intention of the government to control the material, each directs producers of the material to accept and fill all defense orders.

Typical and of special importance are M-17 and M-21, the iron and steel control. This starts with producers of pig iron, and the Priorities Division takes on itself the burden of deciding how much of the available supply shall go to foundries for casting and how much to the mills for manufacture of steel. Pig iron producers are required to set aside a percentage (determined each month by OPM) of output in a pool to be shipped in accordance with instructions from the division. Moreover, each month they must submit to the division their proposed schedule of shipments. No iron may be shipped until the division has made such changes as it wishes and approved the schedule.

Control over steel itself is considerably less strict. Steel producers are required to accept and fill all defense orders and are allowed to fill non-defense orders after de-

RAW DESERT TO FINISHED AIRPORT!

A "Caterpillar" Diesel D8 Tractor with LeTourneau scraper on the Army's air base for advanced training at Litchfield Park, Arizona. 175,000 cu. yds. of dirt are being moved in this operation.

This Pioneer crusher, powered by a "Caterpillar" Diesel D13000 Engine, supplies crushed rock for cement runways at the Litchfield Park Field.

Truck roads at new Air Corps base are maintained by a "Caterpillar" Diesel No. 12 Motor Grader. Barracks in background will house pilots in training.

THE Army Air Corps has to have good flying fields and plenty of them to put through its huge new program of pilot training. One reason why it's getting them in a hurry is the hard-hitting, load-moving power of "Caterpillar" Diesel equipment.

From the first rough grading right through to the finished runways, "Caterpillar" Diesel Tractors, Engines and Road Machinery handle the job with speed and economy. They're built to *work* and *keep on working*. Down-time is reduced and schedules kept up by the rugged dependability of "Caterpillar" construction. And costs are consistently lowered by the superb "Caterpillar" fuel system that permits the engine to operate cleanly and efficiently on the cheaper grades of fuel.

Meeting America's defense needs is one of the toughest assignments ever tackled by men in the dirt-moving industry and by the manufacturers who supply their tools. But the job will be done.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR
REG. U.S. PAT. OFF.

DIESEL TRACK-TYPE TRACTORS
ENGINES AND ELECTRIC SETS · ROAD MACHINERY

fense demands have been met. Specific OPM approval of delivery schedules is not required, but OPM asserts its right to direct steel producers from time to time to make specific deliveries and to direct steel buyers to place their orders with specific producers.

All steel buyers must fill out and turn over to the producer a form (PD-73) telling what the steel bought is to be used for. Every month the steel producer must consolidate these reports into a report to OPM on the use being made of his steel.

Steel warehousers may only buy steel up to a quota set by OPM—currently equal to the rate of purchases during the first quarter of 1941. They may use an A-9 rating in buying up to this quota. After setting aside enough carbon steel for present and anticipated defense orders, warehouses may make deliveries to non-defense consumers. However, except in very small lots, they may not deliver alloy steel to non-defense users.

Special construction procedures

The variety and number of construction projects entitled to P-19 ratings is so great that several special procedures have been developed for different classes of construction — publicly - financed housing, private housing, and roadbuilding. On publicly-financed housing, the Federal Works Agency has been authorized to give its contractors project ratings in much the same way that the Army and Navy Munitions Board does to military contractors.

Project ratings are to be granted to builders of 200,000 privately-financed houses. Ratings will only be given to houses in designated defense areas, costing less than $6,000 or renting for less than $50, and in the occupancy of which preference will be given to defense workers. The rating can only be used in purchasing building materials included on a special Defense Housing Critical List.

A builder who is eligible for a rating makes application to the nearest local FHA office. There his application is checked for correctness and forwarded to an OPM field office, where it is reviewed jointly by a representative of the Priorities Division and one from the Coordinator of Defense Housing. If the application is approved, a rating is issued in the field office.

Road priorities

All roads with federal money in them are entitled to priority aid under another special scheme which is administered by the Public Roads Administration. High ratings are assigned to construction of access roads into military reservations or munitions plants, and progressively lower ratings to construction of roads on the strategic network, both primary and secondary. Procedure is for each state highway department to draw up a list of its projects that are eligible for ratings and turn the list over to the local PRA office. After examination, the list is referred to PRA in Washington and, if that agency approves, a rating is issued. Municipalities and counties are not specifically included in the plan, but they may call upon PRA for priority assistance.

A scheme to aid municipalities and state governments to get ratings for their construction work other than roadbuilding is being studied but is not yet worked out. To date, the only procedure is to follow the regular course of sending a letter of application to the Project Rating Section, Priorities Division, OPM.

Limitation orders

One other form of priority control, which is still narrow in its application but is likely to increase in importance, is the Limitation or L order. An L order is applied to a non-defense industry and establishes a maximum output which it will be permitted to produce. It sometimes grants a priority rating to aid in getting materials for production up to the quota. To date, four L orders have been issued, all dealing with the automobile industry.

The governmental structure by which priorities are administered has gone through a number of drastic revisions in the past year and will probably go through more. At the moment of writing, it is as follows:

Setting general policies is the new Supply, Priorities, and Allocation Board. This deals with broad questions such as the extent to which civilian needs shall be protected, whether to bring a particular material under priority control, and the like. It is composed of the seven heads of the major defense agencies.

Under SPAB is the Office of Production Management, headed by Knudsen and Hillman. OPM is divided up in two ways. At the top it is split into divisions—priorities, production, civilian allocation, materials, labor, and contract distribution. Each of these divisions maintains a more or less skeleton staff to deal with the general aspects of its subject. Thus Priorities Division, as such, is responsible for the formal issuance of ratings and the development of procedures. It has various sections, also, such as the Project Rating Section under Ward Freeman and the Maintenance and Repair Section under Jerry Low.

Cutting across this breakdown into divisions, OPM is split up into "Industry Branches." Each branch handles the problems of a particular industry, product or material. For instance, there is a steel branch, an aircraft branch, a construction branch, and about twenty-five others. Each is supposed to deal with all the problems—including priorities—of its particular field. On the staff of each branch is a specialist from each of the OPM divisions. These branches handle most of the detailed work in connection with the administration of priorities. So far, however, the construction branch, headed by A. V. Kahler, has not concerned itself much with priority problems, and most priority aid to construction has been handled either by the Project Rating Section or by the industrial branches—steel, copper, or the like.

Fortunately, the man who needs a priority rating need not concern himself overmuch with the internal mechanics. It is usually sufficient that he address applications and correspondence to the Director of Priorities, New Social Security Building, Washington, D. C.

EXTRA Tough . . .
EXTRA Flexible . . .
MONARCH PRE-FORMED
made from
2 KINDS OF WIRE

NO. 573-C

INNER WIRES ARE EXTREMELY FLEXIBLE. They're drawn in a special way to make them extra strong, extra pliable. They're improved plow steel too. They bend easily over your sheaves and drums. These wires are the reserve strength of Monarch Whyte Strand PREformed.

OUTER WIRES ARE EXTRA TOUGH. These wires are improved plow steel, specially drawn for outside service . . . made to provide better abrasion resistance. They are Monarch Whyte Strand PREformed's "first line of defense" . . . that's why we give them a *tough* abrasion resisting skin.

And then to provide for EXTRA long life, every wire in Monarch Whyte Strand is thoroughly covered with a special lubricant which protects unseen, inside surfaces against corrosion and friction. This better wire rope is available from stock in the correct size, grade and construction.

Your equipment may be similar to hundreds of others. *Take advantage* of the experiences of others having equipment like yours—ask for a Macwhyte recommendation of the rope that has proved itself to be the best for your equipment.

MACWHYTE COMPANY, *2903 Fourteenth Avenue, Kenosha, Wisconsin*
Manufacturers of wire rope to meet every need — left-&-right lay braided slings — Stainless Steel wire rope — Aircraft cable, Aircraft tie rods, and "Safe-Lock" Swaged Terminals. · *New York Pittsburgh · Chicago · Ft. Worth · Portland · Seattle · San Francisco. Distributors throughout the U. S. A.*

MACWHYTE EXCAVATOR ROPES

TESTED INTERNALLY LUBRICATED PROVED

The correct ropes for your equipment

PRE-FORMED FOR BEST PERFORMANCE

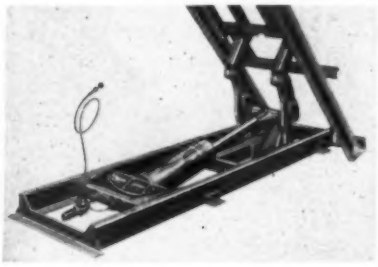
For your convenience in writing to Macwhyte Company, you will find a card bound in this issue.

Equipment you ought to KNOW ABOUT

Heavy duty hoists

Manufacturer: Anthony Company, Inc., Streator, Illinois.

Claims: Complete line of hydraulic hoist drum bodies in capacities from 5 to 30 tons, will be of the double arm "super" hoist design. The entire line from the smallest to the largest, including single cylinder and twin cylinder



models, will have the "power speed" feature. Also through the use of "balanced" piston type of control valve the complete line will be equipped with latest "push-pull" dash control. Other features of the design are telescopic tipping and subframe for "lower mounting" and greater load and truck stability; unit construction which makes the entire dump body unit independent of the truck chassis and uses the chassis for nothing other than to carry the load.

Flexible air hose

Manufacturer: The B. F. Goodrich Company, Akron, Ohio.

Claims: The ½ inch size can be bent to a three inch radius without collapsing or cutting off the air supply. Designed so that

strength and efficiency are combined with minimum weight and ease of handling. Stocked in ½ and ¾ inch sizes. Of two braid construction, the hose can easily withstand working pressures of from 80 to 125 pounds. Compound of the tube is of oil resistant rubber, with excellent heat resisting characteristics. The tube does not flake or clog tools. Yarn reinforcement affords a safety factor of more than five to one under a working pressure of 125 pounds, while the golden ply insulation has been especially developed to assist in flexibility and resistance to kinking.

For further details about the equipment on this page please write to the manufacturer, mentioning Excavating Engineer.

Treatment for diesel cooling systems

Manufacturer: Water Treatment Company of America, 1159 Hodgkiss Street, Pittsburgh, Pa.

Claims: Non-injurious. Strictly organic water treatment for circulatory cooling systems in diesel engines. This treatment, which consists of only a single liquid addition to the cooling water, removes all scale and rust from the cooling system and completely inhibits further formations. The formula, "Baerite 22-A," consists of a number of especially developed vegetable substances which are entirely harmless to paint, rubber gaskets, metal, etc., because they react only in the presence of alkaline water, rust and scale deposits.

Fabric crane bearings

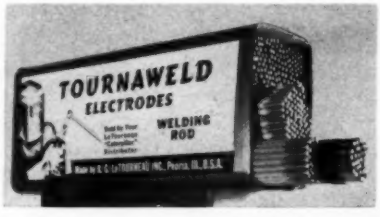
Manufacturer: Gatke Corporation, 228 North LaSalle Street, Chicago, Illinois.

Claims: Compared with conventional bearings, these special Fabric Crane bearings give longer service—have 50% less starting friction—and 30% less running friction. Lubrication is less critical, and the bearings do not score journals. Even if lubrication fails, journals are not damaged. These bearings also withstand shocks and impact loads that fatigue ordinary metal bearings. They are non-corrosive and withstand fumes that destroy metal bearings. They also withstand dust, dirt and neglect better than conventional bearings. These Fabric Crane bearings are moulded to finished dimensions in all shapes and sizes for replacing conventional bearings without changes.

Wire rope, Welding rod

Manufacturer: R. G. LeTourneau, Inc., Peoria, Illinois.

Claims: A 6x9 filler wire right lay wire rope with an independent wire rope center and an identifying galvanized core strand, made especially for cable-operated, tractor-drawn equipment. Made of 199 fine steel wires, each wire being bathed in oil as it goes into the strand die. The following sizes are available ⅜", ½", 9/16", ¾" and ⅞". Developed expressly for the various welding applications used in manufacture of Le Tourneau equipment, Tournaweld



electrodes are now available for general maintenance work from the "Caterpillar"-LeTourneau distributor organization. Tournaweld is available in the following sizes: 5/16", 9/32", ¼", 3/16" and ⅛".

Ear plugs

Manufacturer: Mine Safety Appliances Company, Braddock, Thomas & Meade Streets, Pittsburgh, Pennsylvania.

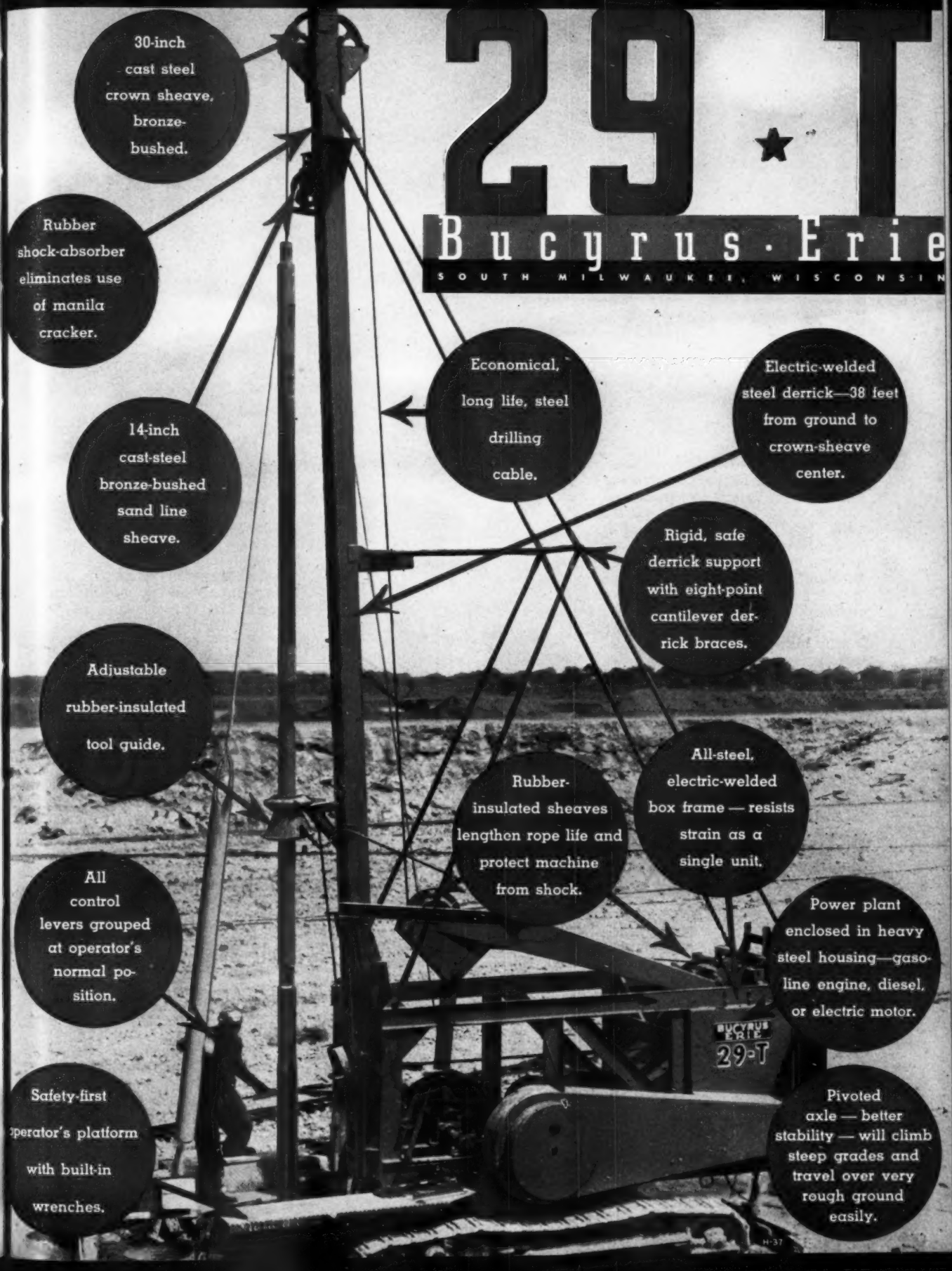
Claims: Fatigue, irritability and nervous exhaustion experienced by workers in or about noisy operations are lessened by the use of Ear Defenders which reduce

DRILL FOR LESS *with the*

29-T

Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN

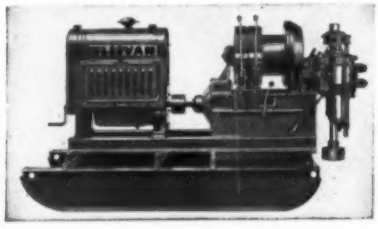

30-inch cast steel crown sheave, bronze-bushed.
Rubber shock-absorber eliminates use of manila cracker.
14-inch cast-steel bronze-bushed sand line sheave.
Economical, long life, steel drilling cable.
Electric-welded steel derrick—38 feet from ground to crown-sheave center.
Rigid, safe derrick support with eight-point cantilever derrick braces.
Adjustable rubber-insulated tool guide.
Rubber-insulated sheaves lengthen rope life and protect machine from shock.
All-steel, electric-welded box frame — resists strain as a single unit.
All control levers grouped at operator's normal position.
Power plant enclosed in heavy steel housing—gasoline engine, diesel, or electric motor.
Safety-first operator's platform with built-in wrenches.
Pivoted axle — better stability — will climb steep grades and travel over very rough ground easily.
BUCYRUS ERIE 29-T
H-37

loud noises to about 1/10 their former loudness, yet are so designed that warning signals and conversation can be easily heard. The plug is a tapered tube molded from surgical-type soft rubber permitting easy insertion and removal without any danger of coming in contact with the ear drum.

Core drill

Manufacturer: Sullivan Machinery Company, Woodland Avenue, Michigan City, Indiana.

Claims: A new heavy duty core drill known as the No. 22-HD can be used for coal and mineral prospecting, oil field service or testing



foundations for heavy construction. It is built for surface drilling under tough operating conditions and is rated at 1750 ft. capacity with "E" rods. This drill is a direct drive machine with power unit connected to the drilling head through the 4-speed automotive type transmission by means of a clutch. The built-in clutch allows the use of any power unit having a stub shaft if operating characteristics are suitable. The unit can can be quickly dismantled for muleback transportation.

Pneumatic tractor tire

Manufacturer: The B. F. Goodrich Company, Akron, Ohio.

Claims: Called the Industrial Tractor Type Silvertown, the tire is designed to equip the traction wheels of small farm type tractors which, because of their mobility and speed, are finding wide acceptance in industry. Available in two sizes, 8-24 and 9-24. Has an unusually thick tread, providing adequate traction for off-the-road service as well as long life on highways, ramps and other paved surfaces. Strengthened with Duramin, the combination of chemical ingredients used to impart long life and durability to rubber, the tire is expected to have application on industrial tractors moving raw materials and finished goods at freight terminals, steamship docks and lumber yards as well as in manufacturing plants.

Paving breaker

Manufacturer: Ingersoll-Rand Company, Phillipsburg, New Jersey.

Claims: Sixty pound class paving breaker known as the CC-60. For jobs where it is not feasible to use a heavier tool. Used in industrial plants for maintenance and "hard-to-get-at" jobs such as wall openings and foundation work. Ease in handling, less fatigue for the operator and less

breakage of parts as a result of an air cushion which absorbs the blow of the piston when the steel is not in contact with the work. Developed as a light-weight easy-handling tool, it may also be used for all-around paving breaker work. Net weight is 63 pounds; overall length, 27 inches; ¾ inch inlet; hose size, ¾ inch; size of steel, 1⅛ inches.

Waterproofing product

Manufacturer: Primoid Products Corporation, 103 Park Avenue, New York, New York.

Claims: A waterproofing compound which effectively seals concrete, brick, stone and other types of masonry, as well as wood and composition materials. This product can be used to prevent or correct any leakage problem from mere moisture to a flowing stream. It is a clear rubber-base liquid which can be either sprayed or brushed on, penetrating deep into the material, sealing the surface and adhering permanently. It can also be used as a coating for iron, steel and other metals, and will prevent corrosion, because it is resistant to oils, alcohol, gasoline, brine, acids, and other chemicals. Available in 1, 5 and 10 gallon cans, also in 30 and 55 gallon drums.

LeTourneau scraper

Manufacturer: R. G. LeTourneau, Inc., Peoria, Illinois.

Claims: The Model DLS Carryall Scraper with a rated capacity of 8½ cubic yards struck and 11 yards heaped, has been designed

for use with the new "Caterpillar" four-wheel tractor. This scraper is very similar to the Model LS; chief changes being in the yoke for mounting on the pulling tractor and in the position of the power control unit.

Grinding wheel, Transformers

Manufacturer: Ideal Commutator Dresser Company, Sycamore, Illinois.

Claims: Abrasive type grinding wheel dresser that is said to give a cutting and truing effect almost equal to that of a diamond. The cutting wheel is held in a protective metal housing which deflects the grindings away from the operator. A large handle makes it convenient to hold and use. The cutting wheel is replaceable when necessary. Overall length 13¾". Weight 3⅛ lbs.

The Lo-Volt transformer is a safety device for workmen using electrical extensions in damp, all metal or otherwise hazardous locations. This step-down transformer is easily plugged in between the power supply and the extension to reduce the extension voltage to a harmless 6 volts eliminating the danger from shock caused by bad sockets or defective extension cords. Available for 110 volt, 50-60 cycle or 25 cycle AC.

Steve says iron mining's improved—but we'll do it better yet

"Seems like when it comes to building and defending America, our folks always can improve ways of doing it. Every so often we've had to produce more iron ore faster and cheaper, and we've always come through.

"The way we're taking ore out of the range today wouldn't have been possible twenty or thirty years ago. Of course, we were producing big then for railroads, trolley lines, buildings, and bridges. Then came automobiles, and production jumped up plenty.

"We were doing a good mining job then, but we didn't have the powder and caps we got now, or the equipment for drilling and handling.

"Those Hercules people have done a lot to help us shoot the ore better. First off, they came along with that

Hercomite* powder to do the blasting jobs at lower cost. Then it was Gelamite*, and wasn't that something! I'm not saying the regular Hercules gelatin powders don't do a fine job—none better. But most places, Hercomite and Gelamite do just as well. And where you can use them, they knock our costs down like they knock down the ore.

"Believe me, those Hercules service men are on the job, too. They know how their stuff should be shot. It's going to be hard to improve blasting much more, but I'm betting we do. And I'm betting Hercules powders and service men will lead us to it."

HERCULES POWDER COMPANY
INCORPORATED
972 KING STREET, WILMINGTON, DELAWARE
*Reg. U. S. Pat. Off., by Hercules Powder Co.

C-21

HERCULES

EXPLOSIVES AND BLASTING SUPPLIES

For your convenience in writing to Hercules Powder Company, you will find a card bound in this issue.

NOT in the *Contract*

"Hey, John," called out the service station attendant, "Your doctor is out here with a flat tire!"

"Indeed! A most interesting subject!" came the voice of the boss from the rear of the building. "Diagnose the case as flatulency of the perimeter and charge him accordingly!"

She: "Can you drive with one arm?"

He: "Sure."

She: "Okay, have an apple."

The sergeant strode into the squad-room. "All right you xxx!! lazy apes, fall out!" he exclaimed.

The soldiers grabbed their hats and swarmed out—all but one who continued to lie on his bunk blowing smoke rings.

"Well?" roared the sarge.

"Well," remarked the rook. "There were a lot of them, weren't there?"

Judge: "What is the source of your income?"

Rastus: "Ah ain't got but two, yo' honah."

Judge: "Well, what are they?"

Rastus: "Seben and 'leben."

It takes an income of six figures to get a man in the rotogravure section, but one figure will get a girl there.

Jones (who has called around to see if his friend has recovered from a wild night): "Is Mr. Wozzy up yet?"

Landlady (sternly): "Yes, he got up, drank his bath, and went back to bed."

FOUND: Woman's bag left in my parked car. If owner will pay for this advertisement she can have it. If she will tell my wife how bag happened to be there, I'll pay cost of advertisement. Telephone Jefferson 8100 — the quicker the better.

Sherman Was Right

A northern woman, unaccustomed to the ways of our new army, was traveling in the South and unknowingly entered war-maneuver territory. One day upon coming to a bridge she was waved to a stop by a soldier in full battle array.

"You can't cross this bridge lady," barked the soldier, "We have just blown it up."

Getting out of her car the astonished traveller walked up closer to the bridge but could see nothing wrong with it. Dumfounded, she decided to investigate further and walked over to another soldier lying peacefully in some shade. "Young man," she inquired, "Can you tell me any reason why I can't cross this bridge?"

"Sorry, I can't tell you mam," was the sober reply, "I don't know. I've been dead for three days."

Night Club: A place where the tables are reserved but the guests aren't.

Information Clerk: "Madam, this train goes to Omaha and points West."

Madam: "Young man, I want a train to Oshkosh, and I don't care which way it points."

Etiquette writers insist a woman should not overlook even the most insignificant detail of her wedding arrangements. Huh, if it weren't for him there wouldn't be a wedding!

Please, ma'am, could you spare me an old coat?

But, my good man, the one you are wearing is nearly new.

I know it, ma'am, and it's this coat that is ruining my business.

She: "Would you like to see where I was operated on for appendicitis?"

He: "No, I hate hospitals."

Did the patient take the medicine I prescribed for him religiously as I ordered?

No, sir, he swore every time.

"There I was, forced down on a desert island with a lovely blonde."

"What did you do for food?"

"Darned if I can remember."

THAT'S HARD TO TIP

NO MATTER WHERE YOU USE IT!

Here's Why

A scraper that stays on top when the going gets tough . . . that can make short, non-stop turns . . . that handles easily on steep slopes — that's the scraper that produces.

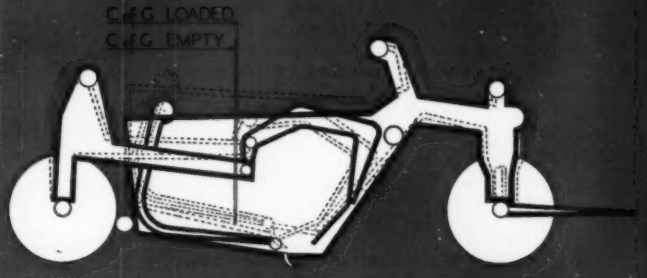
This ability to "stay put" is basic in the design of Bucyrus-Erie 4-Wheel Scrapers. It is one of the important reasons why operators prefer them. For instance, Dan Brown, operator of a Bucyrus-Erie S-112 now working on the Trans-Isthmian Highway in the Canal Zone, writes as follows:

> "We have ten of your scrapers here on the Trans-Isthmian Highway. They are tops of all the scrapers I have ever operated. "I have always liked a scraper that would stay right side up no matter where you put it. Your scraper certainly won't turn over if the smallest precaution is taken. "I hope that as long as you make scrapers you will not forget to make them wider than the tractor. In digging a slope, this wide scraper can be held right up against it and any kind of slope desired can be cut."

The unusual stability of Bucyrus-Erie 4-Wheel Scrapers is easily explained:

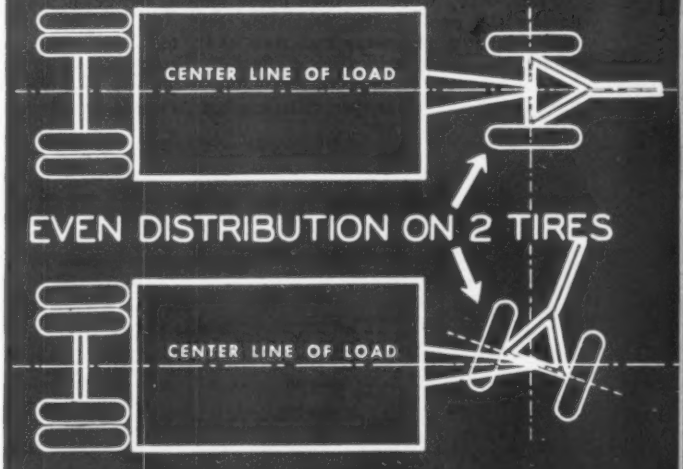
1. Center of gravity is low. There are no top-heavy superstructures or control mechanisms. 2. Weight is distributed properly to each set of wheels so that flotation is balanced. 3. It loads evenly and ejects the load evenly. 4. Whether loaded or empty, center of balance of load on front axle does not shift when front wheels are turned.

All of these factors combine to simplify operation . . . to lessen chances for breakdowns and time losses . . . and to keep maintenance costs at a minimum. In addition, Bucyrus-Erie Scrapers have many other features that are sure to increase your output on any job.



LOW CENTER OF GRAVITY

There are no deadweight superstructures and no heavy, complicated control mechanisms. Horizontal center of gravity is practically the same when the scraper is empty or loaded.



BALANCED FLOTATION

Load is evenly distributed so that each pair of wheels carries its share of the weight. Wide spread of rear wheels provides maximum resistance to overturning. Center of balance of weight on front axle does not change when front wheels are turned.

★

AL TRACTRACTOR DISTRIBUTOR

P121

Shots from the FIRING LINE

Panama's Third Lock Site Excavation Gets Underway

By B. F. Jacobs

Panama Constructors, Inc., formally began, on September 26, the huge job of removing 30,000,000 cubic yards of dirt on the Pacific side of the Panama Canal's new third set of locks. The work was officially inaugurated by Colonel Joseph C. Mehaffey, engineer of maintenance, and Colonel Thomas B. Larkin, supervising engineer of the special engineering division.

Colonel Mehaffey touched off the first dynamite blast for the new Miraflores Locks, and Colonel Larkin took the controls of a Bucyrus-Monighan walking dragline and dug the first twelve cubic yards of dirt from the lock site.

Executives of the Panama Constructors, Inc., who attended the ceremony included S. A. Healy, president of the company; Thomas M. Price, vice-president; M. R. Miller, general superintendent and Kenneth A. Clark, chief engineer.

Canal officials attending the ceremony included Lieutenant-Colonel Hans Kramer, assistant supervising engineer; Captain Thomas De F. Rogers, acting assistant to the supervising engineer; John W. Sibert, Jr., Pacific area engineer and others. Present at the ceremony as guests of the Panama Constructors, Inc., were eight daughters of men who had worked in the Zone during construction of the Panama Canal.

Preparatory work has been going on during the past weeks, consisting of assembling the necessary materials and equipment, constructing living quarters for employees and erecting and equipping the necessary shops.

● **Colonel Thomas B. Larkin, supervising engineer of the Panama Canal's Special Engineering Division, takes over the controls of a Panama Constructors, Inc., Bucyrus-Monighan walking dragline and digs the first 12 yards of dirt from the new third lock site.**

A machine shop has been built with space for welding, mechanical and machine departments; a blacksmith shop; a power house, a warehouse and a rock-crushing plant. An office has been built and is already occupied and a laundry and dry-cleaning plant is underway. A large tire storage and repair shop will soon be started.

The warehouse building will be equipped with 20,000 separate bins for the storage of parts and a fully equipped tire shop for repair work on any size tire and space will be provided for storage of $250,000 worth of tires. A single tire for one type of machine used will cost $1,000. The blacksmith shop has five small drill bit sharpening machines, each equipped with a forge. Two large machines and forges for sharpening large drill bits and two automatic heat treating units for hardening drill steel.

Living quarters for employees and their families are being constructed and are well advanced. Two 80-man dormitories for bachelor workers have been completed. Another will be built. These three are in addition to the ones which were built by canal authorities and assigned to the contractors.

Work is three-fourths completed on thirteen apartment buildings located in an area between Cocoli and the Canal. Work has been started also on thirty-six four-family apartment buildings north of Cocoli gold townsite, and grading is being done west of Bruja Road for eight one family cottages.

Over $2,000,000 worth of equipment for heavy excavation and hauling will be used. Five electrically driven 120-B Bucyrus-Erie combination dragline and shovels have been assembled and are being tested. Two 54-B's are also working at present.

A Bucyrus-Monighan 9-W walker is excavating the side of a hill casting into a lowland area so it can begin excavating there. The 9-W is equipped with a 200-foot boom and a 12-yard bucket. Hauling equipment includes six Tournapull tractors with six 25-yard

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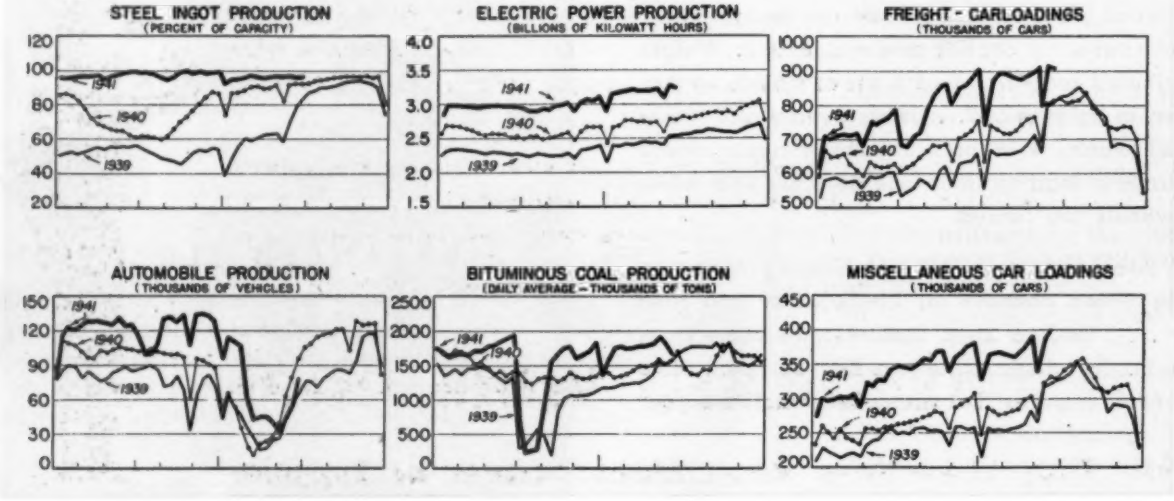

11,000 "Jeeps" Could be Made from Steel Conserved by Preformed Wire Rope

★ More and more preformed wire rope is being demanded by American industry because it lasts longer—reduces frequency of machine shutdowns for replacements—steadies production—is easier and safer to handle. Therefore, it saves both time and money.

★ That is reason enough for its specification during normal times. But these are not normal times. Today preformed wire rope is a national necessity because, through lasting longer, it conserves steel which America vitally needs.

★ For instance, the steel conserved this year by the longer service of preformed wire rope would be enough to build more than 11,000 United States Army reconnaissance cars.

★ Preformed wire rope benefits both you and the Nation.

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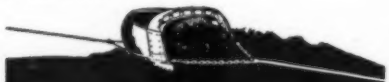

SAUERMAN BROS., INC.
474 S. Clinton St., Chicago

wagons to work with them and 40 thirty-ton Mack trucks. Work will be in full swing by December. It is estimated there will be 1,000,000 cubic yards of material removed every month.

Rock roads are being built to the spoils area and rock surfacing will be added when the big rock-crushing plant is ready to operate. An earth cofferdam has been constructed at the lower end of the Miraflores lock site to keep tidewater out of the excavation area.

Mason & Hanger Awarded New York Tunnel Contract

By Bethune Jones

Acceptance of the $13,984,619 bid submitted by Mason & Hanger, Inc., for construction of the two parallel tubes under New York Bay, comprising the Manhattan under-river section of the Brooklyn-Battery vehicular tunnel, was announced October 5 by the New York City Tunnel Authority.

The bid was made on Contract 6, which calls for driving the two tubes from the tunnel construction shaft in Battery Park to a point under the bay approximately two-thirds of the way to Governors Island. Each of the tubes will eventually accommodate a two-lane traffic highway. Their construction will require the services of an army of sandhogs, working under pressure at times as high as 30 pounds to the square inch.

The Contract 6 work, which was scheduled to start within a week or two following acceptance of the bid, will progress until the bore reaches and joins the tube to be driven toward it from Governors Island. At the same time another bore will be driven from Governors Island in the opposite direction to meet the Brooklyn section of the tunnel, on which work was started last June.

The bid by Mason & Hanger was the lowest of those submitted. Next lowest were for $14,376,030 and $15,240,000, submitted by the Seaboard Construction Corporation and S. A. Healy Company, Inc., respectively.

Rapid progress on construction is expected to be made possible by priorities recently granted to the Tunnel Authority for materials needed for the $57,000,000 Brooklyn-Battery tunnel project. Tunnel Authority officials said the granting of these priorities indicated that federal authorities consider the project of strategic importance in national defense. When completed, the tunnel will be available as a protected vehicular link for both military and civilian transport between Brooklyn, Manhattan and New Jersey.

Construction of the tunnel, which will be two miles long, will use up about 71,000,000 man-hours of labor, of which 21,000,000 will be at the site and 50,000,000 in production, processing and transportation of necessary material and equipment. The tunnel will enable motorists to travel from lower Manhattan to the Red Hook section of Brooklyn in four minutes.

The Contract 6 awarded to Mason & Hanger, Inc., was made with the approval of the Reconstruction Finance Corporation, which is providing funds for the tunnel project.

Through the offices of the Borough Presidents of Manhattan and Brooklyn and with the cooperation of the City Park Department, the city is carrying out collateral projects in connection with the tunnel job. On the Manhattan side new traffic arteries and approaches will be constructed and Battery Park will be remodeled and improved. On the Brooklyn side, approach facilities will be provided and the new tube will be linked with the borough's highway and parkway system.

New Defense Road Proposal On Congressional Program

Members of the U. S. House of Representatives' Roads Committee have been at work for several weeks on a revised draft of a defense highway bill to reconcile their views with those of the senate as reflected in S. 1840, already passed, and objections of the president voiced in his veto message on S. 1580.

It is known that serious consideration is being given to the new measure substantially the same as the bill which was passed and vetoed, except there is no special authorization for funds to correct critical deficiencies in the strategic highway network. The proposed bill would permit the use of previously authorized and unapportioned federal aid

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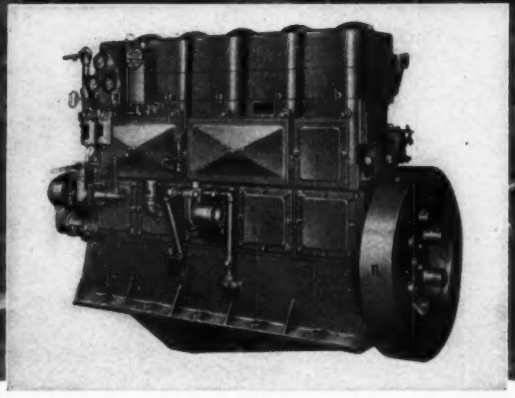
George F. Reichneder, surface mining contractor of Pottsville, Pa., is using an Atlas powered P. & H. Long Range Dragline, in addition to 5 smaller machines powered with other engines.

The P. & H., Model 955LC, is equipped with an 80' boom and carries a 3 cu. ft. Page dragline bucket. It is used in stripping coal veins to a depth of 70 feet.

In commenting on the performance of his Atlas powered P. & H. Dragline, Mr. Reichneder says: "Our operators are not able to stall the Atlas engine, even in the hardest digging. In fact, it is the machine I depend on for pulling rock and stripping the tough spots.

"Fuel consumption is remarkably low considering the hard work this machine is doing in comparison with smaller machines. We operate three 7-hour shifts per day, seven days a week. Maintenance has been negligible." He concludes with: "I have tried to tell you of results only."

Here, may we suggest, that if you, too, are more interested in results than in conversation—you will get more power, with less interruption, over a longer period, and at lower cost from a heavy duty Atlas Diesel Engine. We solicit your inquiries.



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funds, amounting to $287,530,000, on the strategic network on the basis of 75% from the federal government and 25% of state money. On the basis of a 75-25% matching, this $287,530,000 now authorized would permit a construction program of nearly $400,000,000 on the strategic system.

In addition, the proposal under consideration would provide $150,000,000 for access roads and $10,000,000 for airplane flight strips as authorized in the original bill.

The proposed measure seeks to sidestep the president's objections to apportionment of funds for improving the strategic road network on the regular federal aid basis. It is said to contain legislative provisions which will greatly facilitate planning and carrying out the needed program of defense highway construction and improvement.

National Reclamation Asso. Receives President's Approval

President Franklin D. Roosevelt has commended the tenth annual convention of the National Reclamation Association at Phoenix, Arizona, which came to a close October 17, as an example of democracy solving its own problems through public discussion.

In a letter to O. S. Warden, president of the association, he said the Americans attending the convention of water conservationists were "demonstrating the strong stuff of which a free society is made."

The association held its tenth annual meeting at Phoenix to consider present and future plans for irrigation development in the western United States. The president assured the association of his support to federal reclamation but cautioned the convention that power - producing irrigation projects would receive first attention.

"Emphasis must be placed," he said, "on public works that fit the immediate national defense need. Thus, power will be the element in the multiple-purpose projects which will, in most instances, determine whether and when construction shall be started."

Secretary Harold L. Ickes of the De-

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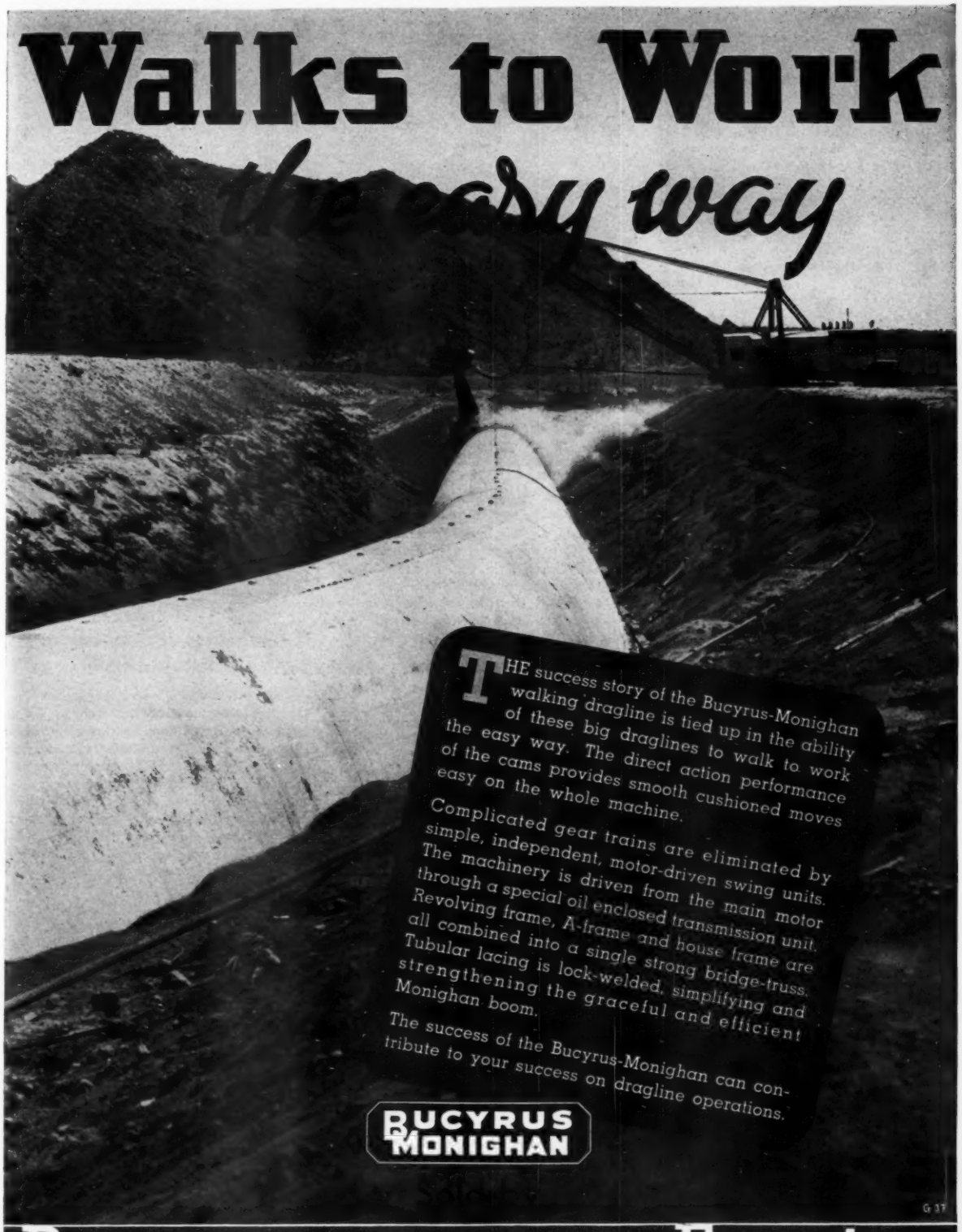
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The success of the Bucyrus-Monighan can contribute to your success on dragline operations.
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partment of the Interior also sent his greetings to the convention. He transmitted them personally through Under Secretary John J. Dempsey, whom he assigned to the meeting together with numerous other interior officials including John C. Page, commissioner, Bureau of Reclamation, and acting director of the Power Division Abe Fortas.

Nearly 1,000 representatives from the Great Plains to the Pacific Coast and from the Canadian border to the Rio Grande attended the national convention. Meetings extended from Wednesday, October 15 through Friday, October 17. Headquarters of the delegates were at the Westward Ho Hotel.

The role of irrigation and particularly power developments in national defense, like those at Boulder and Grand Coulee dams built by the Bureau of Reclamation, occupied the attention of delegates. The importance of irrigation developments as dependable sources of food supplies was stressed.

Highway Research Board Meets in Baltimore

Changing a custom of twenty years' standing on account of the need for conserving Washington facilities for urgent defense needs, the Highway Research Board announces that its twenty-first annual meeting will be held at John Hopkins University, Baltimore, Maryland, the first week of December, 1941.

On Tuesday, December 2 several departments of the board will hold open meetings for the consideration of papers and reports.

Sessions of the board for the discussion of topics relating to highway finance, economics, design, materials, construction, maintenance, traffic and soils investigations will be held on Wednesday, Thursday and Friday, December 3-5.

Forecast Pan-American Highway Travel in '42

Travel by automobile from Argentina to Canada after October 12, 1942, was presaged by the Fourth Pan-American Highway Congress, held in Mexico City, September 15-24. A resolution passed by this conclave recommended that this

date, which commemorates the 450th anniversary of the discovery of America, be set for the official dedication of the hemispheric highway. Representatives of the North, South and Central American nations united their efforts to advance and co-ordinate the development of rural and urban highway construction throughout the Western Hemisphere. In addition to the official delegates designated by the various governments, representatives of numerous public institutions, private associations and enterprises, highway officials and engineers attended as associate delegates.

Unification of traffic regulations in all countries served by the Pan-American Highway, including governmental examinations for driver licenses, was recommended by the congress. Another resolution urged that all Pan-American countries devote to road construction and conservation work the taxes on gasoline and other motor fuels used by highway traffic, as well as additional taxes for road building and maintenance work. A regular exchange of statistics and all publications of a technical nature among the road commissions was also recommended. Approved by the congress was a proposal for organizing an international federation of automobile associations to develop public interest in completion of the highway, as well as to promote tourism throughout the Americas. A proposal that each country served by the highway should appoint a technical commission to handle local problems in connection with road use was also approved. Lima, Peru, was designated as the locale for the next meeting of the congress, which will be held in 1943.

Held concurrently with the highway congress was the Second Inter-American Travel Congress for the promotion of travel among the American republics. The Department of Communications and Public Works of Mexico sponsored an impressive display of road-building equipment at the National Stadium. American road builders participated in this exposition, which presented the newest developments in road-building machines and materials. Featured was equipment especially fitted for highway construction in the Latin American countries. Considered the best display ever staged in Mexico by the road-building industry, the exhibit received the praise of government officials and engineers. The Mexican government participated with displays of maps, pictures, tables and models.

Engineers' Defense Board Established

Establishment of the Engineers Defense Board, an organization of members of six leading engineering societies, to act as a "clearing house for the engineering professions on information dealing with defense" was announced September 29 in New York.

Represented are the American Society of Civil Engineers, the American Institute of Mining and Metallurgical Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, the Society of Automotive Engineers and the American Institute of Chemical Engineers.

The board will advise government agencies and when requested will do

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research work for the Army, Navy and other defense agencies. Special committees will be formed to "attempt improvements of standards and practices of long standing where savings of materials can be made."

Robert E. McConnell, consultant of the Office of Production Management, is chairman of the board. Other officers are Dr. Harry Rogers, president of Brooklyn Polytechnic Institute, vice chairman, and Dr. A. B. Parsons, secretary.

Propose Mahoning River Dam

Construction of the $7,000,000 Berlin Dam on the Mahoning River 10 miles northeast of Alliance, Ohio, was recommended to the U. S. War Department in October by the Office of Production Management.

OPM Director-General William S. Knudsen recommended the project in a letter to Robert P. Patterson, acting secretary of war, transmitting a report prepared by W. A. Hauck, steel consultant.

The Mahoning Valley, which extends approximately 30 miles through Youngstown, Ohio, to the Pennsylvania line, is the third largest steel center in the United States, the report says.

Maintenance, Supplies' Priorities Will Protect U. S. Mines

A maintenance, repair and supplies plan which will help approximately 15,000 mines to boost their production for defense has been announced by Donald M. Nelson, director of priorities.

The order permits mining companies to use a rating of A-1-a, the highest defense rating, to expedite deliveries of materials needed for emergency repairs.

Rating of A-8 may be used by mine operators and their suppliers to obtain material required for emergency inventory purposes or for operating supplies or for ordinary maintenance work.

A special plan has been developed to administer and operate the order. The governor of each state has been asked to designate a state official, preferably an official dealing with mining operations, to help administer the order in his state.

It is expected that the state official in each case will be known as the Emergency Coordinator of Mines. This official will submit to the OPM a list of the active mines in the state. He will also receive in his office each month a list of all purchases made under the terms of the order by the mines, and he will report any excessive purchases or irregularities to the OPM for investigation.

After consideration of the lists submitted by the emergency coordinator in each state, the priorities coordinator for mines will assign serial numbers to all mines approved.

Dr. Wilbur A. Nelson, priorities coordinator for mines in the Office of Production Management, will administer the order.

Purchases made by mines for repair parts, maintenance items and operation supplies will carry an endorsement on the purchase order certifying that the purchases are made under the terms of the new order, P-56. No special forms are required in connection with the application of the rating to deliveries.

Suppliers of mining operators can extend the rating by a simple endorsement and a re-extension can be made to other suppliers in the same manner.

A mine operator or a supplier in order to apply the A-8 rating, must endorse a statement on the original and all copies of each purchase order for material to be used for the purposes specified, certifying that the order is placed in accordance with the terms of the new plan.

A mine operator before he can apply the A-1-a preference rating for emergency repairs must first ask permission by telephone, telegram, or letter from the priorities coordinator for mines. Telegram authorization by the coordinator will be sufficient to permit purchase of the necessary materials under the emergency A-1-a rating.

Around 15,000 mines of all kinds will be eligible for inclusion. Gold placer mines are excluded, but other placer, dredge or hydraulic mines producing products other than gold are included. Open-pits and strip mines are included, and this will include producers of many building materials.

Speed Equipment Maintenance with *More* Simplex Jacks!

Put additional Simplex Jacks to work and watch maintenance jobs speed up as maintenance costs go down. A jack in the crib for every maintenance crew will pay off in shorter out-of-service time for much needed production equipment. Dick Construction Company, Hazelton, Pa., uses Simplex No. 22 Jacks — lift full 10-tons on cap or toe lift — to keep big stripping buggies and other equipment on the go. Flimsy jacks wouldn't last long in the Dick shops, but rugged, Simplex Jacks with the gold medal award safety mechanism can take it. Send for Cat. 41.

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dependable and efficient

Lever Type for toe and cap lifting.

Hydraulic for easier cap lifting.

Screw Jacks for economy.

It makes Hand Loading Pay!

Don't let high costs "get you down" . . . put your material handling on a profit basis. Save man-power and get more man-hours by equipping your trucks with a Brooks

LOAD LUGGER

It keeps up a steady pace of hauling and dumping, while the workmen fill the empties on the ground. No idle equipment, no waiting to load. When you can't get more trucks . . . make your present trucks more effective with a LOAD LUGGER and a set of dump buckets. The unit can be easily mounted on any standard chassis.

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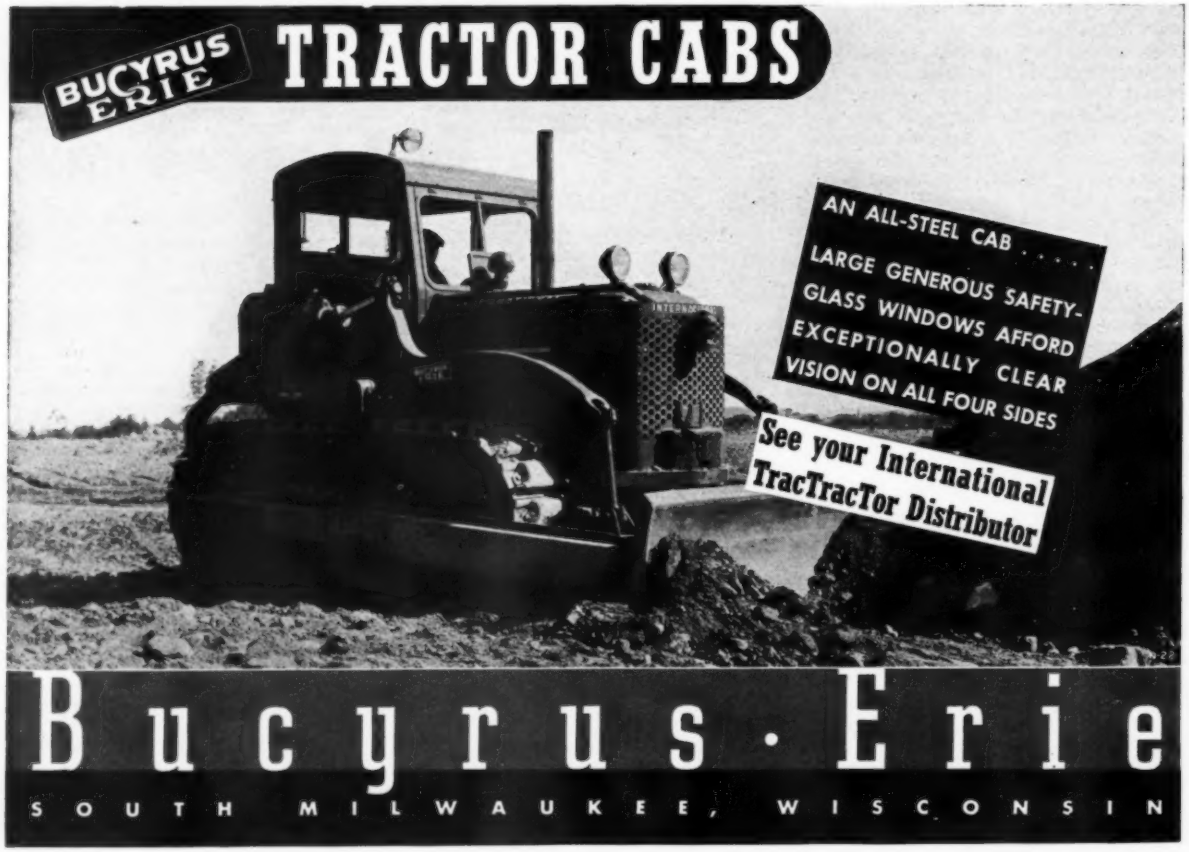
Cement Quarry

(Continued from page 615)

line sheaves make wire rope last longer. A spacious working platform gives the 2-man crew plenty of room to stand while drilling.

Holes spaced on 20-foot centers are bored to certain levels to make a terrace effect in the quarry. The holes of the first course are of different lengths to take care of the uneven top surface, but from the first bench on down they run about 70 feet deep. The longest hole ever drilled went down 208 feet from a high knoll to bench level. Casing is sometimes required up near the top where material is seamy.

The different kinds of material in the quarry are all so familiar to Quarry Superintendent Arnold that he can gauge quite accurately just how much powder to use in shooting it down. In some parts of the quarry a pound of 45% powder will knock down seven tons of stone. In other places where the rock is tougher the same amount will move only three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tons. Sometimes, too, it is necessary to use a faster powder; 60 or 65%; to get good breakage. Each shot presents some individual problem. No brand of powder is used exclusively. The Victorville business is divided among several companies.

A well organized schedule must be used on the job to be sure that the supply of raw material will always reach the mill in the right proportions. The amounts of lime rock, clay, iron ore and gypsum vary considerably as different grades of cement are produced. Since gypsum is not present in the Victorville quarry, the other four elements make up the bulk of raw material coming from the quarry. Gypsum is secured from points many miles northward and is hauled in by railroad.

Loading Out Operations

When the rock is shot down the Marion 4101 electric shovel moves in with the fleet of Macks. What few large rock of two tons or more remain unbroken are pushed aside by the shovel, drilled with jackhammers and broken up with 60% powder. The Marion then loads out the 8-yard trucks, usually making about four swings with the 2½-yard dipper per truck. This loading work is tough on a shovel. With 20 tons of bail pull available at the dipper, the 4101 doesn't have any trouble keeping all six trucks busy on a 600-foot haul. This shovel uses 75 horsepower on the main hoist, with 23 horsepower motors on both crowd and swing. A 1-inch Roebling hoist line is used.

The excavated rock, after being loaded into the Macks, is hauled from 500 to 1,500 feet to one of the two loading platforms conveniently situated nearby. There it is dumped into side dump cars having three skips each, with each skip holding one truckload of rock. The idea of two locomotives was discarded several years ago. All switching and hauling is now done by one locomotive in an interesting manner.

A 65 HP Davenport locomotive, with a string of empties from the mill attached to the front end, backs in alongside the loading dock. When it comes to the string of loaded cars, the brakeman hooks the rear drawbar to this string. From there on all there is to do is back up on a spur track until the empties are spotted where the loaded ones were, unhook, throw the spur switch, and tow the load on down to the mill.

Down at Victorville the rock is pulverized, burned, and run through huge grinders which reduce the residue down to the fine consistency of flour. When it emerges from this process it is ready for use in the building industry. Distributed both in bulk and 94-pound bags, it is hauled to many distribution points in Southern California by a fleet of truck transports.

As the Victorville plant grows, so does the city prosper. Some $550,000 annually is now expended in payrolls to the people of the town. The mill has been largely responsible for a 500% population increase of the town in the past 20 years.

Several men still on the payroll have been with the company nearly a quarter century.

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Construction Camp Memories

(Continued from page 617)

men slipping on deck and falling in the river. True enough, Mike hung his head all the next season for ever falling in line with safety prevention, but deep in his heart he got a great deal of satisfaction from working a safe crew.

In like manner, work methods improved. In the old days, pile dikes were driven in a crazy pattern as much as ten feet out of line. When the pile hammer was lifted off the driven pile, the winchman was supposed to have the driver spotted for the next pile by the time the hammer reached the top of the leads. This of course led to crooked dikes with a lot of trouble getting clumps tied and stringers in, but what the Hell, production was the important thing. If a pile drove hard, ten or fifteen feet was chopped off the bottom end and the pile was driven short.

These haphazard methods gave way to a slow realization that good piledriver men were men who drove piling the way they should be driven. Piledrivers were rigged with water jets to insure full pile penetration. A few pains were taken to keep the dikeline targets brought up somewhere within sight, and the dikes began to look straighter. When the willow supply was exhausted, a lumber mat was designed and mat foremen went to no end of trouble to see that the mat fingers were true to line. And instead of throwing rock pavement on a bank in any fashion, pavers began to take pride in placing the rock the way pavement should be placed.

When this was done, the result surprised everybody. It was found that by taking a few pains to get the work right the initial trip, time was actually saved and unit production increased. Piledrivers which had been driving 30 or 35 piles per shift and losing time setting stringers in the crooked dike which resulted, were able, with the new idea, to drive almost twice as many piles, drive them straight, and in many instances to lay the stringers as they went along!

This improvement in operating methods holds true in other lines of work as well. Mr. McCarthy, who has been in the excavation business for a great number of years, recalled the old days when grades were cut by eye and fills were placed without surveyor's fill stakes to guide the operation. While it is true that many an old time excavation walker, cat-skinner or dragline operator has gained through his experience a keen eye, it is equally true that even the best of them usually carry a hand level nowadays to check their work.

Everything else—mining, quarrying, road and highway work—all of them have seen this change in their phase of the business as a whole. These changes, in more ways than one, were brought about by the construction workers as they changed. And since we were reminiscing about the men, this brings us to the reasons why the construction worker changed at all.

The secret of it all was his en-

"... as many as 100 men were quartered together in immense bunkrooms."

vironment. I think perhaps by far the greatest alteration in the life of the construction worker was the abandonment of the old construction camp which was shoved to one side in favor of better living quarters.

Old-Time Construction Camp Life

The old-time construction camp, in case you have never had the bad fortune to be quartered in one, was something to remember. The galley was often dirty and full of grease. The cook was a sour individual who sweltered in his own gore, stirred a huge pot of beans with a wooden spoon, and sold a little whisky on the side. He was usually the only man in camp who saved any money, and consequently was the Shylock of the gang, lending money to various members of the crew from payday to payday.

Meals were good for the first three days, but soon the monotonous routine of the same kind of food went against one's taste. By the end of the season one had to choke his food down or take a snort or two of whiskey before meals to work up a false appetite.

"The cook was a sour individual who sweltered in his own gore and sold a little whiskey on the side."

Beds were thrown together in an immense bunkroom, where as many as 100 men were all quartered together. Blankets, if they could be called blankets, were dirty black colored "horse-blankets" so common twenty-five years ago. Mattresses were made of straw ticks, thrown on a framework of crude springs. Bunks were usually racked three high. Out of the average crew, 45% had body lice or crabs. The main bunkroom was hot and sultry, reeking with perspiration odor in the summer months. During cold weather the doors and windows were closed, and the air became thick with tobacco smoke from the poker tables. Tomato cans, built to hold two gallons, were brought up from the kitchen and used for spittoons. Some of the old men could hit the tomato can at ten feet with part of their quid, at least, without looking away from their ace in the hole.

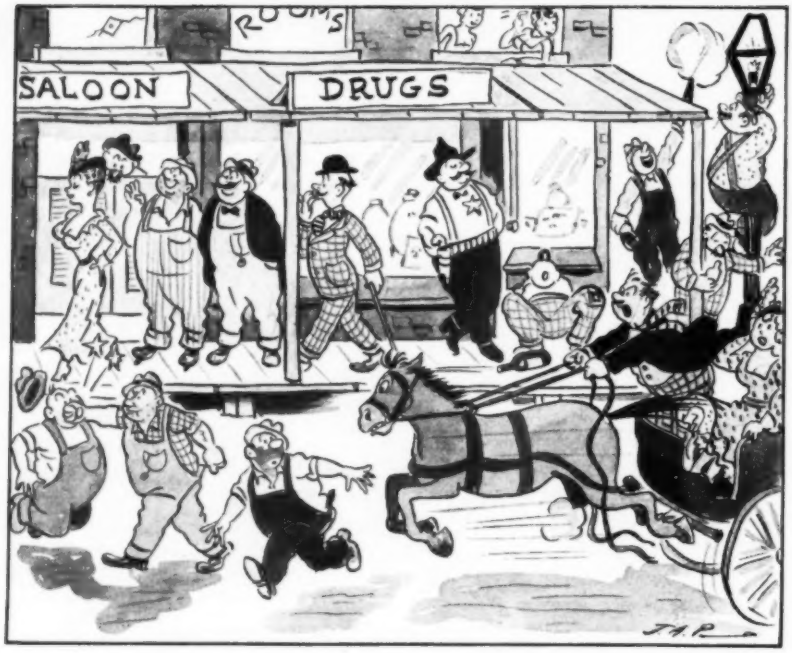
In the midst of this was about 25% of the crew trying to sleep. Those who could read and write had a cheap school tablet across their knee, writing letters for themselves and those of the boys who could not write. Some of the crew off shift read detective or western stories, talked about the work, or about women. There was usually a good fiddle player, someone who could second on a guitar, banjo, or mouth organ, and for some strange reason many of the waiters I knew could play the accordion. This musical minded group, with a knot of listeners, gathered around in the center of everything and ground out "The Arkansaw Traveler."

Toilets were unsanitary, usually located so far back in the woods that nobody ever bothered to use them. Men simply stopped before they reached one.

In the face of conditions like these, few of the men were married or had families. They couldn't afford to be. They were a motley assortment, consisting of Americans, Englishmen, Scotchmen, Irishmen, Germans and Scandinavians. In most of the camps wages were miserably low. The men worked hard. A charge for quarters and subsistence was held out of their check, as was a doctor's tax. On payday, whatever remnant of their wages was left changed hands over a gambling table or was spent in the nearest town in a drunken orgy which caused all respectable women to stay at home behind drawn shades, and which terrorized everyone.

The cost of maintaining a camp, purchasing food in remote sections, managerial expense and in later years the added unemployment insurance became more and more a headache to the average contractor. Then, slowly but surely the pendulum swung, and in ten years the construction camp and the construction worker changed.

Roads improved all over the country and soon Henry Ford brought out a dependable jaloppy which would take a man to work and bring him home. About that time the working day changed from twelve to eight hours of labor and after World War I wages soared higher and higher. Men



"Payday meant a big time in the nearest town."

had more leisure time. Somewhere along the line more and more of them married, and many of the contractors started laying off men of the floater type, retaining married men in their place. At night, when the day's work was over, these men hopped in their "crates" and drove home to their families. Little by little the population of the construction camps began to decrease.

And the contractors began to find out that a transformation decidedly to their advantage was taking place. This better type of worker who rested in security, enjoying the evening with his family, began to save money by not making the rounds of the beer joints. With the added incentive that a wife and family alone can bring, this worker began taking more and more pains with his work, studying special lines of it and working out details to the company's advantage. Personal pride, workmanship and production stepped along hand in hand until the unit cost of production had cut itself in half.

Modern Homes Near the Job

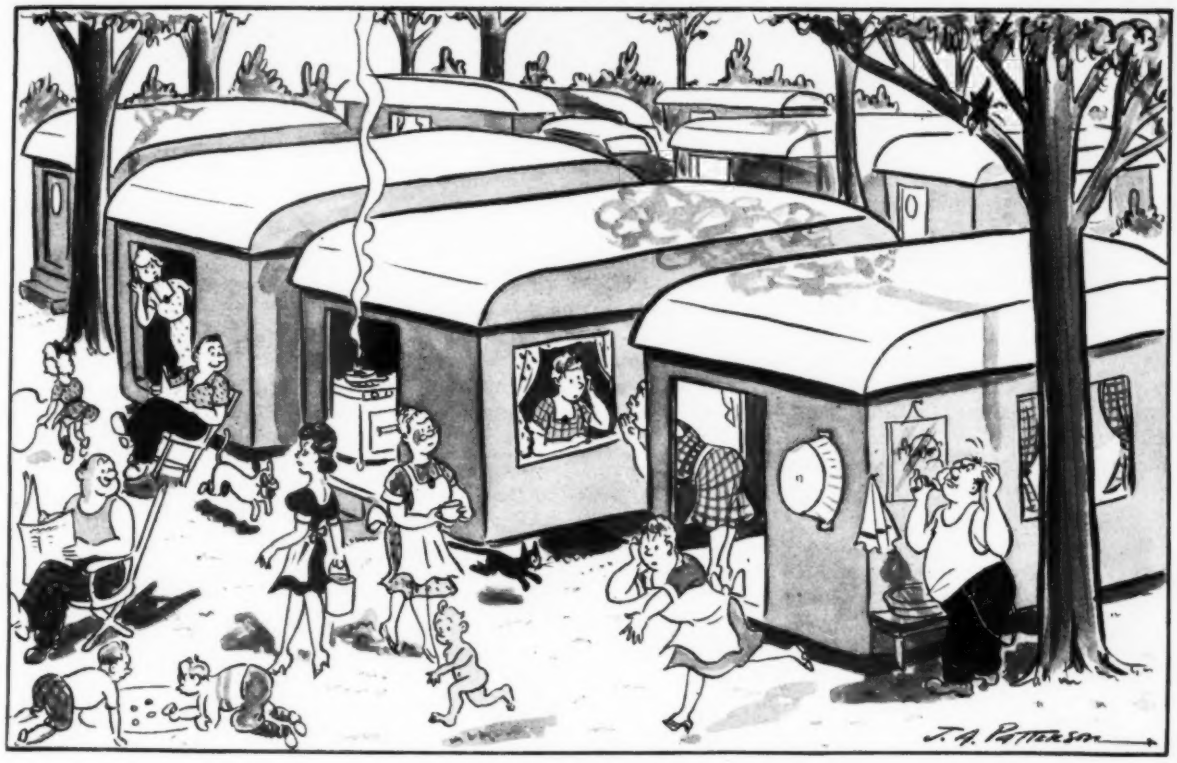
Progress always brings higher standards of living with the remarkable changes it makes. It has been said that poverty, in 1940, means doing without a few of the things our grandfathers never heard of. It became a part of the average construction worker's daily life to spend his leisure time in company with his family. It was part of his standard of living. When some of the big dams and aqueducts were started in the western part of the country in 1933, men were reluctant to live in construction camps. So they brought their families to the job. How? The answer to this one was the house trailer. Faster and faster the house trailer camps sprang up. Strong, dependable, mobile trailer units, many of them equipped with air conditioning and all the luxuries of 20th century living began to crawl over the same bleak desert the covered wagons traversed in '49. A new era was born.

Contractors soon began providing a plot of ground for trailer camps near the jobs. At Parker Dam, Arizona, the Wood Construction Company provided a clean trailer park for the employees on Parker Dam. Morrison-Knudsen, Inc. provided a 5-acre plot on a railroad job near Yucca, Arizona. This park was graded, light wires and water mains run to every two units, and shower baths were installed. This bit of cooperation on the part of the contractor saved the workers thousands of dollars by their not having to drive 30 miles to Kingman, Arizona, over bad rough roads.

This arrangement gave their workers two more hours each day with their families, saved them high rent and automobile expense.

All over the west and southwest, trailer camps are spreading

". . . a dependable jaloppy which took a man to work and brought him home."



"Men began to bring their families to the job."

from job to job. Contractors are beginning to find out that by providing trailer space on unfortunately remote jobs, they are creating a cooperative feeling between themselves and their employees, and are getting more work for their money, more cooperation, and fewer strikes.

"Yes, Mr. McCarthy," I said, after we had talked these things over, "times certainly have changed. Why, I've seen deckhands on the Great Lakes Dredge and Dock Company's 'New Jersey' studying ICS courses, mastering the slide rule and reading Oliver Goldsmith. And they were good deckhands, too—better, in fact, than the old-timers."

"I know, Bixby," the old man agreed. "That's why I said I'd like to see just once again a camp full of the type of men we used to have. I'd like to put my boy in one for a few months to season him up. He gets out of college this summer."

"You wouldn't really wish that bad luck on him," I said. "Would you really want your son to break in with a bunch of roughnecks like the old gangs we can remember?"

The old man's eyes twinkled. "Yes, and I'll tell you why," he smiled. "My boy has been losing money playing poker at Harvard. I'd like to set him down in a game with Red Hanson, Swede Larkin and Jack Gardner. They'd damn soon teach him something about the game; something he didn't learn at college. Come on, Bixby, let's go to town and have a drink!"

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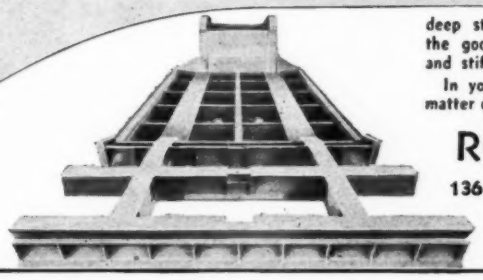

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EXPERIENCE builds 'em PERFORMANCE sells 'em

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Filling a Rush Order for Uncle Sam

(Continued from page 623)

Material dumped into the hopper takes a ride on a 220-foot 30-inch United States Rubber belt conveyor up an incline to the top of the aggregate separating and cleaning plant. From here a 60-inch rotary screen, a 5x8-foot Deister 3-deck vibrating screen, and a 36-inch jaw crusher sort, crush and clean the pit run gravel, producing sand and three sizes of gravel. Two pumps handle the water necessary for the process, one pumping water into the plant, the other removing it after it has performed its washing duties.

Only two sizes of the gravel are used by the Jefferson proving ground for concrete work. The two by-products of the operation, pea gravel and sand, are being stored by the company for future use.

Loading Out Pit Run Material

Nearby, on a higher level of the pit, the Bucyrus-Erie 37-B works in a deposit of coarse gravel. Loading to trucks bound for the proving ground, this machine is equipped with a 65-foot boom and 1½-yard bucket. A continuous stream of trucks keeps the dragline swinging as it loads out about 200 yards per hour. This pit run gravel is used by the Army Engineers at the proving ground as underlayment material for buildings, primary runways, and area roadways. Standard Materials produces an average of 2,000 tons screened and 2,000 tons pit run material per 8-hour shift by these methods. During the peak season in August, production of all materials ran as high as 40,000 tons per week, practically all of this tonnage being processed material.

The job of transporting materials as they are produced has been delegated by subcontract to Weeden & Hines of Indianapolis. To keep the aggregate rolling on the 14-mile haul over hard-topped highways to the Jefferson proving ground, this organization is using 90 trucks of varying makes that average about 4-yards capacity each.

Just to make sure that they would be kept busy, Standard Materials has also contracted to furnish a modified pit run coarse gravel to the Bituminous Materials Company of Terre Haute. This company, which is also sending its product to the Jefferson proving ground, has set up two bituminous cold mix plants near the Standard Materials pit.

• Bituminous Materials Company of Terre Haute sets up two bituminous cold mix plants near the Hanover pit. Standard Materials is furnishing a modified pit run coarse gravel to these plants.

• On-the-job supervision at Hanover is handled by (L to R) Paul Simpson and Arthur Hild, project superintendents, and H. E. Brown, production manager for Standard Materials.

The Men Behind the Job

The men that keep the wheels turning in the Standard Materials Company are: Bruce McCown, president; Thomas L. Harrold, treasurer; H. E. Brown, production manager; Claude M. Harriman, sales manager; and Alvin C. Johnson, secretary. Paul Simpson and Arthur Hild are the project superintendents on the Hanover job.

Established in 1926, Standard Materials specializes in the operation of commercial and portable aggregate plants. The company is now operating commercial plants at Indianapolis, Clinton and Huntington. Some road building and general construction work has also been handled by the organization.

With their Hanover job nearly completed, Standard Materials Corporation is also well underway on a contract awarded to them in July to furnish road gravel for the U. S. Army's Southwestern Proving Ground at Hope, Arkansas. This job is similar to the Jefferson Proving Ground setup and quantities of material will also be about the same.

The material at Hope, Arkansas, is being handled with a Bucyrus-Erie 55-B dragline, swinging a 2½-yard bucket from a 60-foot boom, and a Bucyrus-Erie 37-B dragline equipped with a 1½-yard bucket.

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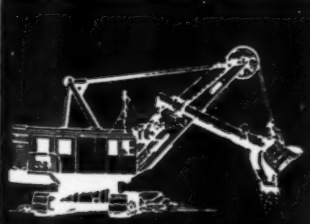
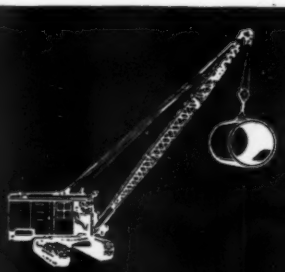
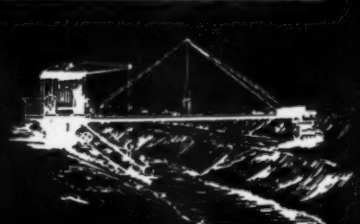

Notes from the manufacturers

Hercules Powder Company, Wilmington, Delaware, has announced the retirement of C. D. Prickett, vice president and director, effective October 1. Mr. Prickett has been with the company since its formation in 1913, when he was put in charge of all Hercules black powder operations. Mr. Prickett has been associated with the powder business for more than sixty years. In 1913 he became a director and assistant general manager and a few months later was elected vice president.

National Research Council announces the appointment of Fred Burggraf as assistant director. Mr. Burggraf has been connected with research relating to highways since 1919. His career has included engagements with: the National Bureau of Standards, the Illinois Division of Highways, the Highway Research Board and the Calcium Chloride Association.

The B. F. Goodrich Company, Akron, Ohio, has named William B. Thompson, manager of the industrial engineering department, construction engineer for The Lone Star Defense Corporation, B. F. Goodrich subsidiary which will build and operate a $35,000,000 government ordnance plant near Texarkana, Texas, it is announced by T. G. Graham, vice-president of B. F. Goodrich and the defense subsidiary. Thompson received his education at Ohio State University, became the company's chief architect in 1928 and was made manager of industrial engineering for the company early this year.

Caterpillar Tractor Company, Peoria, Illinois, announces that Louis B. Neumiller has been elected president of the company by the board of directors. Mr. Neumiller began his association with the company 26 years ago as a stenographer and blue print clerk in the engineering department. He succeeds B. C. Heacock, president since 1930, who becomes chairman of the executive committee. Mr. Neumiller is a member of the Masonic Order, Knights Templer, the Shrine and Jesters, and a member of the advisory committee of the Illinois Civil Service Commission.

R. G. LeTourneau, Inc., Peoria, Illinois, has appointed Elmer Isgren, former plant superintendent as manager of the entire LeTourneau factory at Peoria, Illinois. He succeeds Ray Peterson, vice president and plant manager who resigned to conduct business on the West Coast. Mr. Isgren was first associated with the company in February, 1930, in the Moss Avenue shop at Stockton, California. He came to Peoria in 1935 as a welding foreman and was promoted to plant superintendent in 1937.

Chain Belt Company, Milwaukee, Wisconsin, has appointed G. K. Viall, vice president as head of a new Division of Research and Development now being organized by the company. Mr. Viall has been connected with Chain Belt Company since 1921 in various capacities, including chief engineer, chain division, assistant to the president and works manager. In assuming his new position, he will also retain his position as vice president in charge of the Construction Machinery Division.

Chicago Pneumatic Tool Company, 6 East 44th Street, Chicago, Illinois, has enlarged its production capacity by the acquisition of the Garfield, New Jersey plant of the Champlain Corporation, according to an announcement by H. A. Jackson, president. The company will employ the full facilities of the New Jersey plant for the manufacture of hydraulic equipment used on military and naval planes of all types.

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ROLLED STEEL CONSTRUCTION
for GREATER STRENGTH and SPEED
Lower Head Room
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Welded Construction insures longer wear—less breakage. Cutting down unnecessary weight means faster work—more yardage. Williams sheave arrangement keeps leads straight, less friction and fraying—longer cable life. Sheaves protected against contact with bucket load, open end sheave block prevents clogging.
Bulletin describing each type of Williams Bucket FREE on request.
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THE WELLMAN ENGINEERING CO., 7002 Central Ave., Cleveland, Ohio
MANY PROFITABLE FEATURES IN THIS GENERAL PURPOSE MULTIPLE ROPE BUCKET
WILLIAMS Buckets
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New trade literature

Title: **"Minerals Yearbook Review of 1940"**

Subject: Minerals Yearbook is generally held to be the official reference work and statistical record of the mineral industries, and this new volume in the series, containing 72 chapters prepared by nationally and internationally known specialists in the field of mineral economics and technology, presents the most thorough and detailed study of its kind. Special consideration has been given to all of the minerals classified as strategic or critical in the national defense program, and much information relative to such minerals is published for the first time. Each of the minerals discussed in earlier volumes is covered in the new book and in many instances the coverage has been expanded.

Where to Get: Superintendent of Documents, Government Printing Office, Washington, D. C. Price $2.00.

Title: **"Commodity Yearbook 1941"**

Subject: The purpose of these annual books is to present important up-to-date information and statistics on the basic commodities. The need for such information is of increased importance at this time and considerable space is given to the subject of "War Time Control of Commodities." Other studies of interest and value are included in this portion of the contents. The feature section is followed by 75 separate sections, each devoted to modern marketing of the specific commodity. The text in each section is followed by charts and pertinent statistical data. The answers to most questions that develop in regard to commodities will be found in this informative 636-page volume.

Where to Get: Commodity Research Bureau, Inc., 82 Beaver Street, New York, New York. Price $7.50.

Title: **"Gooseneck Trailers"**

Subject: Profusely illustrated, 30-page booklet dealing with each trailer model individually and completely. Specifications for each type of installation and actual hauling shots are included.

Where to Get: Rogers Brothers Corporation, Albion, Pennsylvania. Free upon request.

Title: **"Effective Water Stoppage"**

Subject: A concise, sparkling story telling how to reduce water seepage through soil and sand and stop leaks in concrete structures with bentonite clay. In describing the clay, the twelve page bulletin tells what it is, how it works, what it has done, how to use it, three experiments, what it costs. Interesting to persons working with ponds, lakes, canals, dams, concrete pools, mines, bulkheads and many other forms of holding or storing water.

Where to Get: American Colloid Company, 363 West Superior Street, Chicago, Illinois. Free upon request.

Title: **"Simplified Arc Welding"**

Subject: A colorful 38-page catalog describing a complete line of arc welders and accessories. Photographs illustrate welders, electrodes, and generators.

Where to Get: Hobart Brothers Company, Troy, Ohio. Free upon request.

Title: **"Catechism of Electrical Machinery"**

Subject: Those who are not familiar with electrical phenomena or terminology can acquire a good working knowledge by reading this well-illustrated 48-page bulletin. This interesting book begins by explaining electricity and magnetism as utilized in electric generators and motors, and goes on to discuss important electrical measurements. The principles of direct-current generators and motors are presented next, followed by an A-B-C examination of alternators and alternating-current motors. Illustrations, including simplified diagrams as well as photographs, are gener-

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Better and Better Materials to *lick* TOUGH Jobs.

The new GATKE *HI-POWER* Swinging Frictions were *developed for heavy stripping*. Other frictions wore out in a few days—HI-POWER Swingers *are giving months* of service. *Imagine* the time and dough saved.

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Disc Type Clutch Facings for all requirements.

Clutch Facings with integrally moulded teeth.

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ously used as aids to clear understanding.

Where to Get: Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago, Illinois. Free upon request.

Title: **"The Austin-Western Badger"**

Subject: A two-color, 16-page bulletin describing and illustrating the operating features of the new Austin-Western Badger. Diagrams illustrate the working range and capacities of the machine.

Where to Get: The Austin-Western Road Machinery Company, Aurora, Illinois. Free upon request.

Title: **"Civilian Technical Corps Data"**

Subject: How qualified men between the ages of 18 and 50 can go to England as U. S. Civilians for non-combatant service. Information on the type of jobs available, wages, etc.

Where to Get: Civilian Technical Corps, 15 Broad Street, New York, New York. Free upon request.

Title: **"The Tournapull"**

Subject: A new catalog printed in four colors. Contains 12 pages of valuable information, facts and illustrations on the Tournapull, models C and super C. Two full pages have been devoted to a cross section view of the Tournapull showing every part which gives the Tournapull high speed operation. This new booklet answers questions . . . gives condensed specifications of both Tournapulls, models C and super C.

Where to Get: R. G. LeTourneau, Inc., Peoria, Ill. Free upon request, ask for catalog TP-104.

Title: **"P&H Excavator"**

Subject: A detailed description of the Model 150 ½-yard excavator. Photographic illustrations make it easy to understand the P&H hydraulic control and the manner in which simple rolled alloy steel attachments permit changeover for shovel, clamshell, crane, dragline, trench hoe, skimmer scoop or pile driver. First-hand information on the construction and other simple features are also given.

Where to Get: Harnischfeger Corporation, Milwaukee, Wisconsin.

Title: **"Metaline Oilless Bronze Bearings"**

Subject: A complete new catalogue arranged in three sections. One describes the lubricating properties of Metaline; the second part outlines the various types and the range of application for oilless bearings and lastly, the catalogue presents detailed data for use in preparing specifications.

Where to Get: R. W. Rhoades Metaline Company, Long Island City, New York. Free upon request.

Title: **"Hypressure Jenny Steam Cleaner Catalog"**

Subject: A new 7-page catalog explains principle of operation, model specifications, and information to aid in the selection of the right model Hypressure Jenny to handle the broadest range of cleaning jobs. Many typical uses are pictured.

Where to Get: Homestead Valve Mfg. Company, Inc., Hypressure Jenny Division, Coraopolis, Pennsylvania.

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Address all box numbers
c/o EXCAVATING ENGINEER
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MECHANIC

Fully experienced mechanic on shovels and draglines. Prefers South or Southern coal fields. Box 9178

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To the reader wishing to advertise used equipment in the "For Sale" Section: All advertising in this section is payable in advance. Enclose your check or money order with copy. Rate: 60c per line. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Holding up your advertisement one month to secure approval of revised copy or an additional remittance may cost you real money in a lost sale. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

To the reader wishing to answer "For Sale" Section advertisements appearing on these pages: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

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Up to 2½ Cubic Yards

FOR SALE—Bucyrus-Erie 10B Gas Dragline and shovel. First-Class Condition. Electric starter. This will not be sacrified but is well worth price asked.

CLIFFORD WATERHOUSE
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BUCYRUS-ERIE 20-B, ¾ yard 2 motor electric shovel. Suitable for power supply of 3 phase 60 cycle 440 volt. Now operating. Located Tennessee. Box 2738

BUCYRUS-ERIE GA-2 Gas-Air high lift shovel. 24' boom. 18'4" dipper handle. 1¼ yd. dipper. Waukesha 6¼"x8" 4-cylinder engine. Electric starter. Quantity spare parts included. Excellent condition. Located Eastern Pennsylvania. Box 2774

MARION Model 361. 1½ yard gas shovel. Also 50' boom clamshell equipment. Electric starter. Buda engine. Located Connecticut. Box 2808

BUCYRUS-ERIE 45-B 65' boom gas dragline. 2 yd. bucket. Buda engine. Good working condition. Located Louisiana. Box 2812

McMYLERS (2) Type A, 12 ft. gauge McMyler Locomotive cranes, 50' booms. Electrically operated with motors. Located Chicago. Box 2834

LORAIN Model 40 ¾ **yard gas shovel. Excellent condition. Located Connecticut.** Box 2803

INDUSTRIAL-BROWNHOIST. 40' boom Clamshell including 1¼-yd. Owen bucket. Buda Gas engine. Ready for a season of hard work. Located Central Illinois. Box 2751

Good used **AMERICAN HOIST & DERRICK** steam shovel, ditcher and crane. Rail type, full revolving, 30' boom for use as a crane. Shovel, boom with dipper and ditcher attachment.

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INSLEY MODEL R ½-yard gas shovel, dragline and clamshell. Engine completely overhauled. Good as new. Balance machine thoroughly field checked—some new parts added. Located Indiana. Box 2783

BUCYRUS-ERIE GA-2 High Lift 1 yd. Shovel. Waukesha WS engine. Single Shaft Cats. Operating condition. Located eastern Pennsylvania. Box 2776

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BUCYRUS-ERIE 10-B Shovel with Backhoe Boom and Bucket, also 33' Crane Boom with Clam Shell Bucket including 10-B Trailer. All in good working order.

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MARION MODEL 37 steam shovel crawler mounting, 32' boom also 50' crane boom and clamshell bucket. Steel cab, good condition, central location. Box 2836

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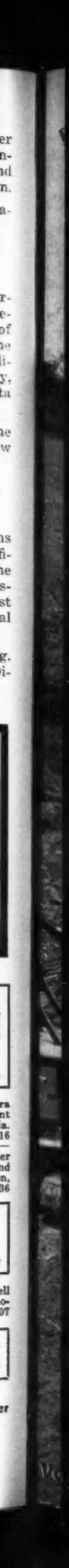
BUCYRUS-ERIE 37-B. Gas—60' boom clamshell with Rudomatic tagline. Electric starter. Located Connecticut. Box 2807

LINK BELT—28-ton, type Y, 1½-yd. R. R. Crane, with 50 ft. boom and 100 h.p. motor. Located Chicago. Box 2833